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CONTENTS

MAJOR CROP PROGRESS AND WEATHER REPORTING

Harvest Progress Reports From Ukraine, Belorussia
(Editorial Report) 1

Briefs

Khabarovskiy Kray Harvest 6
Rice Harvest Figures 6
Petropavlovsk-Kamchatskiy Potato Harvest 6

REGIONAL DEVELOPMENT

Increased Effectiveness of Crop Farming in Siberia Reviewed
(V. R. Boyev; SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI, May-Jun 80) 7

Progress in Transformation of Non-Chernozem Zone
(Editorial; PRAVDA, 19 Aug 80) 13

AGRO-ECONOMICS AND ORGANIZATION

Enterprise Subsidiary Farms in the Northeast
(V. Boyev; PRAVDA, 30 May 80) 16

Agroindustrial Complexes in the Northeast
(V. Romanov; STROITEL'NAYA GAZETA, 29 Jun 80) 19

Subsidiary Farms at Aviation Industry Enterprises
(G. Al'bov, TRUD, 13 Aug 80) 22

TILLING AND CROPPING TECHNOLOGY

Advice on Preparations for Abundant Crop in 1981
(SOVETSKAYA MOLDAVIYA, 8 Aug 80) 25

Preparation of Ukrainian Fields for Winter Crops
(Editorial; PRAVDA UKRAINY, 20 Aug 80) 31

Advice on Preparation of Soil for Winter Crops
(F. Popov, A. Maliyenko; PRAVDA UKRAINY, 23 Aug 80) 34

Kazakhstan Buckwheat Crop Increased
(L. Mozhayev; NARODNOYE KHOZYAYSTVO KAZAKHSTANA, Jun 80) 38

Grain Crop Development Potential in Omsk, Novosibirsk, Altayskiy Kray
(V. R. Boyev; ZERNOVOYE KHOZYAYSTVO, Jul 80) 42

Effect of Uneven Sowing by Seed Drills
(M. K. Kuznetsova, et al.; TRAKTORY I SEL'KHOZMASHINY, 7 Jul 80) 46

MAJOR CROP PROGRESS AND WEATHER REPORTING

HARVEST PROGRESS REPORTS FROM UKRAINE, BELORUSSIA

[Editorial Report] The harvest campaign in the Ukraine has moved into the forest-steppe and the wooded country. Equipment operators are using a complex of various devices in cutting and thrashing the grain. [Moscow TRUD in Russian 26 Aug 80 p 1]

More and more enterprises in Barvekovskiy Rayon, Khar'kovskaya Oblast, are reporting that the good grain harvest allowed them to fulfill the annual and 5-year plan ahead of time. Barvenkovskiy Rayon is close to fulfillment of its grain sales pledge. More strong and valuable wheat has arrived at the procurement points than usual. [Moscow SEL'SKAYA ZHIZN' in Russian 13 Aug 80 p 1]

The harvest of grain crops in Kirovogradskaya Oblast has entered the final stage and the grain is flowing like a rushing torrent from the thrashing floors to the procurement points. Every day the number of enterprises which have fulfilled this year's plan and the 5-year plan grows. Svetlovodskiy Rayon is leading the rayons in Kirovogradskaya Oblast in grain sales to the state. [Moscow SEL'SKAYA ZHIZN' in Russian 23 Aug 80 p 1]

You just would not believe that cyclone with driving rains and winds quite recently blew through over the western oblasts of the Ukraine. Now the traces of large overflows of some rivers are reminders of it. The storm was suddenly followed by hot sunny weather. It turned out in a way that does not happen very often: winter crops, spring crops, peas and buckwheat ripened simultaneously. The usual harvest sequence was out of the question. And there was still the lodged and twisted grain, and water which could not be absorbed into the soil. All this demanded a high degree of organization from equipment operators, enterprise specialists and executive committees of local soviets, as well as expanded resourcefulness which gives good results. [Moscow IZVESTIYA in Russian 19 Aug 80 p 1]

Harvest work in the Ukraine has expanded to a full scale. Early grains and pulse crops have been cut on 10 million hectares. Three-fourths of this has been thrashed. Crimea has already finished harvesting.

Khersonskaya, Zaporozhskaya and Dnepropetrovskaya oblasts are nearly finished. The flow of grain from the kolkhozes and sovkhozes of the Ukraine to the elevators is increasing.

Doing the work this summer has not been simple. The weather, unstable since the spring, delayed the beginning of the harvest significantly: pouring rains, accompanied in several instances by hurricane force winds, twisted the crops over broad stretches. There are tall and stunted, lodged, moist and multilayered (wheat overseeded with barley) crops, unevenly ripened. Work plans had to be adjusted during the course of this, labor organization had to be improved. The combine and windrower operators and truck drivers were called upon to show great skill. Anticipating the weather surprises grain growers in the Ukraine reequipped more than half the combines and 30,000 windrowers for harvesting lodged grain.

From the first days of the harvest they defined the proper relationship between two-phase harvesting and direct combining, with the preference for the two-phase method. This made it possible to begin harvesting 3 to 4 days earlier and to go round the clock while direct combining, as is known, can go forth only until the middle of the night. Thanks precisely to two-phase harvesting that enterprises in several oblasts were able in literally a few days to swath the grain onto windrows and then thrash it quickly. [Moscow SEL'SKAYA ZHIZN' in Russian 12 Aug 80 p 1]

The elevators in Dnepropetrovskaya Oblast are working at full capacity, having taken in about a million tons of grain. Agricultural workers here have finished harvesting. As planned they completed it in 12 days. For the first time a third of it is composed of strong and valuable wheat. Grain growers in Pokrovskiy, Solonyanskiy, Novomoskovskiy and several other rayons got 30 and more quintals per hectare. [Moscow SEL'SKAYA ZHIZN' in Russian 14 Aug 80 p 1]

The last combine has departed the fields of Dnepropetrovskaya Oblast. But the battle for the grain continues. Now it is being waged on the kolkhoz and sovkhoz thrashing floors and at state elevators. And here is the good news; the millionth ton of grain has gone to the state from Dnepropetrovskaya Oblast. Of this 314,000 tons is strong and valuable wheat, for which the sales plan is overfilled. Pavlogradskiy Rayon delivered the largest amount of strong and valuable wheat to the state.

Five rayons of the 20--Pokroskiy, Dnepropetrovskiy, Novomoskovskiy, Solonyanskiy and Krinichanskiy--surpassed the 30 quintals per hectare mark. The grain [kolosovyye] yield for the oblast as a whole, according to preliminary data, amounted to 27.8 quintals per hectare. [Moscow SEL'SKAYA ZHIZN' in Russian 19 Aug 80 p 1]

At the very height of the grain harvest in many rayons in Donetskaya Oblast pouring rains fell unexpectedly. They beat part of the crops to the ground, especially the barley and significantly complicated the work of harvesting and thrashing the grain crops. And just before this, while the grain was filling, hot dry weather set in which had a marked effect on the grain yields. The persistent and goal directed struggle for increasing the pace and quality of the harvest is bearing fruit. With every day more and more grain comes from the kolkhozes and sovkhozes in Donetskaya Oblast. This year they will sell no less than 754,000 tons of grain to the state. [Moscow SEL'SKAYA ZHIZN' in Russian 9 Aug 80 p 1]

The sharp rise in temperatures and drop in humidity in July led to significant losses in soil moisture, especially in the southern and western oblasts. The average daily water requirement for spring crops in the 2nd and 3rd 10 days of July reached 65 to 75 cubic meters per hectare. Under these conditions in order to guarantee the optimum water regime and normal crop development it is necessary to irrigate around the clock with a maximum number of irrigation machines. This is all the more necessary since some crops have reached a critical point in development vis a vis water requirements. It is obvious: violation of the optimum water regime for the soil will lead to a significant (by 30 to 50 percent) decrease in yields. Those crops for which the critical period has arrived should be watered first. [Kiev SIL'S'KI VISTI in Ukrainian 9 Aug 80 p 2]

The harvest has begun on the fields of Brestskaya Oblast. The kolkhozes and sovkhozes will harvest grain and pulse crops from 415,000 hectares. This year it is going forth under adverse conditions. Frequent pouring rains and strong winds have lodged the tall grain over significant areas. Almost a thousand units have been half tracked, equipped with paired lead wheels for work on water-logged fields and drained swamp soils. ZhSK-4 windrowers and Ye-301 mowers are being used to cut lodged grain into windrows. Two-phase harvesting is being widely utilized since it is productive on grain ripening at different times. [Moscow SEL'SKAYA ZHIZN' in Russian 9 Aug 80 p 1]

Despite the adverse weather conditions in Gomel'skaya Oblast equipment operators are striving to make the best use of the harvest equipment. The harvest is proceeding better everywhere this year than in past years. [Moscow PRAVDA in Russian 11 Aug 80 p 1]

An extremely complicated situation has arisen now on the fields of Belorussia. Only 1.219 million hectares--42.7 percent of the plan--have been harvested thus far. This is significantly less than in any previous year. The maximum added increment in harvested area in recent days amounts to an average of 100,000 hectares. If the harvest continues to be conducted at such a pace then it will take a minimum of 20 days to complete it--and in Vitebskaya and Mogilevskaya oblasts even more. It is quite obvious that dragging out the harvest can lead to loss of part of the crop. [Minsk SEL'SKAYA GAZETA in Russian 24 Aug 80 p 1]

Prolonged rains and strong winds have made the harvesting of grain crops difficult in Belorussia. However the collectives of the grain harvest detachments are working in any weather: By day equipment operators harvest waterlogged grain by direct combining, and at night they thrash the mass again, gathering additional quintals of grain. [Moscow SEL'SKAYA ZHIZN' in Russian 27 Aug 80 p 1]

Almost 1 million tons of grain have been sold to the state in Belorussia. [Moscow SEL'SKAYA ZHIZN' in Russian 29 Aug 80 p 1]

This year has been especially difficult for the grain growers in Mogilevskaya Oblast because of the weather conditions. Therefore it is important to lose not one minute in the field, and much depends on how the equipment works. [Moscow TRUD in Russian 3 Sep 80 p 1]

It is difficult to get used to the August rains in Belorussia. But a majority of enterprises in the woodland area is usually able to harvest the primary grain mass, and send the combines to the northern zone, before bad weather, strengthening the technical might of the local kolkhozes and sovkhozes at the decisive moment. This year that did not happen. The preharvest good weather "window" was extremely short and the grain ripened 2 weeks later than usual everywhere. Some woodland enterprises tried to cut the most lodged areas of forage crops for simple feed [monokorm] but estimated the magnitude of future grain supplies in the first days of the campaign and refused. All grain crop areas, including those inundated by water and those on which weeds are quickly taking over are being harvested only by direct combining. On those fields the grain is thrashed first.

It is not the north but the south of Belorussia which has required the help. Thus harvest transport detachments established in several rayons in other oblasts have been sent into Brestskaya Oblast where the situation was especially tense. Everywhere they are following the proven practice of transferring equipment from one enterprise to another taking the current circumstances into account.

And the campaign front is steadily expanding. The inflow of grain from the new harvest to the thrashing floors and state grain reception enterprises is growing. Making maximum use of the advantages of the Ipatovskiy method of work organization, skillfully combining two-phase harvesting and direct combining, eliminating all possible equipment idleness in the field, they have already harvested more than half the grain crops in Braginskiy, Khoynikskiy, and Mozyrskiy rayons in Gomel'skaya Oblast and in Pinskiy, Ivanovskiy, and Luninetskiy rayons in Brestskaya Oblast.

Following the example of the innovators the so-called two-phase method of harvesting lodged and severely weed-infested grain was widespread. These crops were cut into convenient-to-pick-up pyramidal [shatrovyy] windrows by special ZhSK-4 windrowers were set at the lowest cut. After this following a minimal break in time the pick up vehicles go out. Labor productivity in thrashing in this situation is practically doubled, breakdowns and idleness due to the choking of the windrow auguers and thrashing drums are much rarer.

The greatest difficulties fell on the graingrowers of the northern zone of Belorussia. The field contours here are small, the terrain in the locality is rugged. Dokshitskiy Rayon in Vitebskaya Oblast, for example, is under just such conditions. But even here they are doing everything to harvest the crop and establish a firm base for the new harvest.

"The harvest pace is good, the daily added increment in harvested areas amounts to five to seven percent. We are doing all the work as if on a single assembly line," says Dokshitskiy Raykom first secretary N. I. Ustin. [Moscow SEL'SKAYA ZHIZN' in Russian 23 Aug 80 p 1]

Frequent rains, waterlogged soil and in some places even water at the present time do not allow the mechanized harvesting of grain crops at a fast pace. The situation is complicated by the fact that lodged grain is overgrown with weeds, over a significant portion of the winter rye and barley areas the grain is spoiling on the root due to waterlogging, in some places the oats are shattering. All this demands maximum mobilization of forces and means for the most rapid completion of the grain harvest. In Belorussia as a whole almost 40 percent of the grain is still not harvested; in Vitebskaya and Mogilevskaya oblasts, over 60 percent. [Minsk SEL'SKAYA GAZETA in Russian 3 Sep 80 p 1]

The continuing rains have severely waterlogged the soil, made the work of the harvest equipment more difficult, and in some instances made the use thereof impossible. Each day's delay leads to inevitable crop losses.

The main thing now is to increase the pace of the harvest. We must strive so that no less than 5 percent of the grain crops at every enterprise are harvested every day, of these the maximum quantity for seed.

A certain portion of the crops are severely overgrown with grass, the grain is beginning to sprout on the root and they are at the point of perishing. Stretches of grain in this state should be harvested for the preparation of feed by the non-thrashing method. The grain mass therefrom may be utilized for the preparation of simple feed [monokorm] in the form of flour, granules, briketts and silage. The selection of this or that technology is determined by the opportunities and condition at each specific enterprise. [Minsk SEL'SKAYA GAZETA in Russian 4 Sep 80 p 1]

CSO: 1824

BRIEFS

KHABAROVSKIY KRAY HARVEST--The harvest of 1980 is ending under difficult conditions in Khabarovskiy Kray. According to the kray agricultural administration 32,088 tons of vegetables had been sold to the state as of yesterday by the kray's farms, or 35 percent of the target. Only 12 percent of the cabbages required by the plan have been sold as this crop suffered the greatest damage from unfavorable weather conditions. Potatoes have been harvested from 3,958 hectares, or 40 percent of the plan, and 33 percent of the planned seed potatoes have been set aside for next year's growing season. As of yesterday 107,172 hectares, or 50 percent of the plan, had been plowed for next year, which is more than at the same time last year. [OW191154 Khabarovsk Domestic Service in Russian 0930 GMT 18 Sep 80 OW]

RICE HARVEST FIGURES--Some 45,000 hectares of rice are to be harvested. The amount to be sold to the state is not less than 86,000 tons. [SK191252 Vladivostok Domestic Service in Russian 0930 GMT 18 Sep 80 SK]

PETROPAVLOVSK-KAMCHATSKIY POTATO HARVEST--Some 7,011 hectares of potatoes have been harvested. Only 3,627 hectares remain to be harvested. The gross harvested is 10,700 tons. Almost half of this has been sold to the state. [SK191259 Petropavlovsk-Kamchatskiy Domestic Service in Russian 1845 GMT 18 Sep 80 SK]

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INCREASED EFFECTIVENESS OF CROP FARMING IN SIBERIA REVIEWED

Novosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian
No 3, May-Jun 80 pp 92-96

[Article by V. R. B[illegible]ev, corresponding member of VASKhNIL [All-Union Lenin Academy of Agricultural Sciences], Siberian Scientific Research Institute of Agricultural Economics: "Raising the Effectiveness and Stability of Agriculture in Western Siberia"]

[Text] In recent years there have been great changes in agriculture in Western Siberia. Labor productivity has grown and the material well-being of village workers has improved. Nevertheless, most rayons are still not able to satisfy the demand for agricultural products. Existing production resources and the achievements of science and progressive experience are not fully utilized.

The relatively low average level of production output in farming and animal husbandry, especially in grain production, is aggravated by the extensive annual fluctuation in productivity. This has negative consequences for the grain-forage balance of the region and of the country as a whole as well as for branch and total profitability in agricultural production. The annual fluctuation in gross grain yield in the kolkhozes and sovkhozes of Western Siberia reaches almost 50 percent, and that of procurement volume of commodity grain--over 60 percent. For this reason the annual divergence in the cost of 1 ton of grain in 1970-1979 comprised: 34 rubles in the sovkhozes of Novosibirskaya Oblast, 39 rubles in Altayskiy Kray and 50 rubles in Omskaya Oblast. The size of profits obtained from the production and sale of grain to the state fluctuated during these years from 7.2 to 30 million rubles in the sovkhozes of Novosibirskaya Oblast, from 7.9 to 46.5 million rubles in Omskaya Oblast and from 3.1 to 219.6 million rubles in Altayskiy Kray.

As an analysis shows, the amplitude of the deviation of productivity, for example, of grain crops according to years (mainly as affected by weather conditions) from the average indicators for the last 3.5 or even 10 years has not decreased in most Siberian rayons, but has even increased. For example, in Altayskiy Kray the annual deviation in the productivity of grain crops from the average levels of 1970-1979 was greater than for 1961-1970 by 15 percent, and in some rayons and enterprises--by 42-70 percent. Here the average productivity of grain crops in the kray's sovkhozes was 0.5 quintals per hectare lower than in 1956-1960.

In making comparisons we should naturally consider not only the deviation in productivity, but other indicators as well, such as the area of plowland and the area in grain crops, which have increased during this time. As we know, this process is usually accompanied by the inclusion in crop rotation of areas with less fertile lands. We should keep in mind the great transformations that have occurred during these years in the forms of agricultural management, in the supplies of material and technical resources found in kolkhozes, sovkhozes and interenterprise associations, in selection, in technology and in other production indicators.

In Kemerovskaya and Tomskaya oblasts in 1976-1979 the average annual grain yield per hectare decreased by 20 percent in comparison with the Eighth Five-Year Plan and by 10 percent in comparison with the ninth. During the last 15 years the annual deviation in productivity from the average level increased by 7 percent in Kemerovskaya Oblast and by 2 percent in Tomskaya. Here we should keep in mind that the enterprises of these oblasts are relatively better supplied with fixed production capital, energy and fertilizer than the enterprises of Altayskiy Kray.

Stability in farming, as in agriculture as a whole, means not the maintenance of the achieved production level, but the achievement of a [illegible] increase in production output per hectare of land, per unit of labor expenditures and per unit of production capital accompanied by minimum deviations in these indicators from the levels achieved over the years [illegible] intensification.

The stable development of agricultural production is possible only on the basis of the efficient utilization of a complex sphere of factors. These include climate, the quality of the soil and the location of the land.

These factors can be more or less favorable for producing a yield of cultivated crops. Productivity depends upon the biological characteristics of crops and varieties, the crop rotations utilized, agrotechnology, the quality of the work done and the organization and incentives for work. The greatest result can be achieved on the basis of a coordination of factors in which during given specific conditions the biological potential of a given crop of variety is realized to its maximum.

An analysis of selective and mass data from kolkhozes and sovkhozes located in various rayons of Siberia and having differing specializations and production levels attests to the fact that one of the main reasons for the great differences in the productivity of agricultural crops and in the effectiveness of expenditures even in similar soil-climactic conditions is the disproportion between various management links of the enterprise and the underevaluation of the situation concerning irreplaceability of the basic factors of agricultural production.

The shortage of sunlight cannot be compensated for by a favorable temperature regiment, by increasing the fertilizer rate or by high quality technical operations during the cultivation and harvesting of crops. We cannot replace a shortage of moisture, heat or nutrients by other production components.

considering the specifics of agriculture, the [illegible] and [illegible] way to solve the problem of raising the stability of grain production would [illegible] have [illegible] in [illegible] zones and enterprises having the most favorable soil-climatic conditions for its cultivation. But because of the great needs of the national economy in [illegible] agricultural products and primarily in grains and because of the limited [illegible] soil-climatic conditions for obtaining large and stable harvests such a [illegible] solution to the problem of improving the stability of agricultural production [illegible] unacceptable.

Our goal is to [illegible] stable growth of production in farming and animal husbandry on the basis of the national [illegible] achievements and progressive practices and to decrease to a minimum the negative effect of unfavorable factors on the qualitative and quantitative indicators of production. This is a difficult goal, but one that can be reached. This is attested to by the data from testing and experimental enterprises of scientific research and experimental institutions and many kolkhozes and sovkhozes of Siberia where the indicators for crop and animal productivity even in years with unfavorable weather conditions are 1.5-2.5 times greater than the average indicators of other enterprises located in the same soil-climatic conditions.

In the Pervomayskiy Breeding Plant and the Sibir' Kolkhoz of [illegible] Rayon, Novosibirskaya Oblast, the average grain yield per hectare is not less than 18-20 quintals during years with unfavorable weather conditions, as compared with an average grain productivity over many years of 23.5 quintals per hectare. Similar and higher indicators over the course of many years have been achieved by the Berdskiy Sovkhoz of Novosibirskaya Oblast, the Rossiya and Rassvet kolkhozes of Zmeinogorskiy Rayon of Altayskiy Kray, the Sovkhoz imeni 50-letiya SSSR, the [illegible] Test Farm of Omskaya Oblast, the Topolya Test Farm of Tyumenskaya Oblast, and others.

During the last 10 years as compared with the corresponding preceding period the annual deviation in grain productivity from the average levels for Omskaya Oblast decreased from 41 to 25 percent; in Tyumenskaya--from 26 to 13 percent. The average productivity of grain crops increased by 4.5 and 5.3 quintals per hectare respectively. In these oblasts the production of grain and other agricultural crops has increased and the economics of many kolkhozes and sovkhozes have been strengthened.

These examples attest to the great possibilities for raising the effectiveness of farming in Siberia, to the importance of a qualified consideration of all factors involved in the development of agricultural production.

The first, and in our opinion, most important conclusion that can be drawn from the evaluation of natural-economic, biological and technical factors in the development of agriculture is that the unfavorable and favorable weather conditions that affect the productivity of grains and other crops in Siberia from year to year should be examined not as an accidental phenomenon but as one of the special features of agriculture in the region.

In connection with this the agricultural management systems utilized here must consist of a complex of measures, methods and organizational forms which will consider the specific zonal conditions of climate, soil, and the availability of production resources, the utilization of which would secure a stable growth in production output and an increase in the effectiveness of expenditures under existing weather conditions, including unfavorable conditions.

In some zones of Western Siberia it is possible to increase the productivity of grain crops by 2-3 times with the efficient utilization of agroclimactic resources. The region's kolkhozes and sovkhozes have a powerful production base, qualified cadres of directors, specialists and machine operators who are capable of solving complex problems of intensifying agricultural production.

The second conclusion that can be drawn is that significant differences in soil-climactic and other production factors exclude a simple and routine solution to the problems related to securing the stable development of agriculture. Under these conditions there is an increase in the significance of zonal and in some cases of microzonal agricomplexes that include specific proposals on crop rotation, soil cultivation, moisture accumulation, the technology of cultivation and harvesting and the efficient organization and reimbursement of labor. The utilization of such agricomplexes enables us to more effectively utilize actual agro-climactic and material-technical resources of rayons and enterprises and to place the achievements of science and progressive practices at the service of production. Moreover, the development and introduction of such complexes raises the responsibility of scientists, directors and specialists of agriculture in achieving certain indicators for the yield of agricultural crops and the productivity of animal husbandry in kolkhozes, sovkhozes and interfarm associations.

To raise the effectiveness of agricultural production there is special significance in the timely and high-quality fulfillment of elementary technical operations while preparing the soil, conducting sowing operations, during crop care and harvesting. All of this must be done in consideration of existing weather and other conditions of the year.

With each passing year there is a growth in the capacity of units that fulfill the most important technological operations for cultivating and harvesting grain and other crops. All of this raises the requirements for professional training of machine operators and other workers who participate in production. More demands are also made of the technical condition of production resources that are utilized and of the organization of the service that controls the quality of work and the observance of technological discipline.

In addition to the biological and technical factors of production, the final results of work will be greatly affected by organizational-economic factors, among which the most important are the optimization of the utilization structure of plowland and grain lands, efficient production specialization and concentration, and the selection of progressive organizational forms and the stimulation of labor.

Differentiation is required not only for agrotechnical but also for organizational and economic measures as well in the development of the grain industry and in particular in the industrial production of seed, commodity and forage grain with a consideration of zonal natural-economic conditions of enterprise management, the developmental requirements of specialized animal husbandry and the efficient organization of grain procurement organizations and the mixed-fodder industry. In connection with this in the course of the elaboration and introduction of zonal agrocomplexes it must more clearly determine the zones and enterprises which would specialize in the production of specific types of commodity grain, especially in the more valuable varieties of hard and strong wheat, [illegible] and legumes.

In recent years considerable corrections have been made in the structure of grain crops, primarily by expanding the area in barley and oats. This encouraged an increase in grain production because the productivity of these crops, especially of new varieties is 1.6-4.5 quintals per hectare higher than of wheat in a large number of rayons. The yield of grain would be greater as a result of changes in the structure of grain crops if an increase in feed crops on plowland was not tolerated. In 1976-1978 as compared with 1968-1970 the area in feed crops (without corn) on plowland in the kolkhozes and sovkhozes of Western Siberia increased by almost 900,000 hectares. This area could have produced an additional 650,000 tons of feed units if it had been sown in grain crops.

Changes in the structure and distribution of grain crops should be closely linked with the organization of feed production on plowlands, and especially on natural feed lands. To fully realize the advantages of optimal structure in the utilization of plowland and grain crops, changes in the structure and distribution of individual branches of animal husbandry will be required. According to the calculations of the Siberian NII [scientific research institute] on agricultural economics, simply by optimizing the structure and improving the distribution of of grain production the kolkhozes and sovkhozes of Western Siberia can increase the average annual yield of grain by over 1 million tons and raise the profitability of the grain industry, the leading branch in most of Siberia's kolkhozes and sovkhozes, by 14-16 percent.

An analysis of the production-financial activities of a number of kolkhozes and sovkhozes attests to the fact that low indicators for production output, labor productivity and the profitability of production are not always the result of a generally low level of management or of a shortage of production resources. Frequently this is the result of a disproportion between individual production factors. Thus, for example,even with a high soil fertility level the growth of productivity can be hindered by poorly organized seed farming, by a shortage in material-technical resources for the timely fulfillment of work, etc. In animal husbandry, for example, when feeds and the corresponding production facilities are available the productivity of animals is frequently held back on the same level or on a lower level as a result of the less than full-value rations, of the poor organization of the veterinary service or of the poor management of the work of livestock farmers.

The elimination of problems in the production-financial activities of an enterprise is not an elementary process, especially if we consider that, for example, to eliminate a water shortage a complex of measures is needed, including great expenditures for reclamation. For this reason the measures that are directed at the optimization of fixed production factors must be reflected in operational, annual and five-year plans for the development of the enterprise at the different levels of management.

Raising the effectiveness and stability of farming in Siberia is an integral part of the general problem of raising the effectiveness of agriculture as a whole. To successfully fulfill this goal the following are significant:

a) the development of reclamation, primarily in suburban zones, with the aim of intensifying the production of vegetables, potatoes, green and succulent feeds, as well as in other rayons with the aim of creating plots with guaranteed production of seeds for grains and feed crops. Here we must remember that under modern conditions reclamation is one of the most effective means for raising the stability of agricultural production in practically all of the rayons of the country, especially in the Kulundinskaya Steppe and the Barabinskaya Lowlands;

b) the creation of emergency reserves of high-quality seed, feeds and financial resources. Their volume is determined by the structure, achieved stability and volume of agricultural production in kolkhozes and sovkhozes;

c) the realization of operational measures to eliminate or mollify the negative consequences of unfavorable production factors (drought, freezing, and others)for the economic activities of enterprises (resowing, regulating the herd of animals, etc.);

d) the well-based economic stimulation of the production of products needed by the national economy in zones with relatively favorable and unfavorable production conditions (correction of level and coordination of prices, their differentiation, special-purpose crediting, insurance payments, etc.);

e) the development of interenterprise structures on the basis of efficient production specialization and concentration, of the extensive utilization of progressive production technology and of product sales.

The scientists of the Siberian division of VASKhNIL and the agricultural specialists of the region developed the "Recommendations on Systems of Agricultural Management for the Western-Siberian Zone Under Conditions of the Transition to an Industrial Basis, Increased Specialization and Concentration in the Period Until 1985." The creative use of analytical data, proposals and recommendations on the main problems of developing farming and animal husbandry as made by agricultural specialists will encourage an increase in the effectiveness of agricultural production in Western Siberia.

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REGIONAL DEVELOPMENT

PROGRESS IN TRANSFORMATION OF NON-CHERNOZEM ZONE

Moscow PRAVDA in Russian 19 Aug 80 p 1

[Editorial: "Sponsorial Aid to the Non-Chernozem Zone"*]

[Text] Four years ago Uzbekistan sent its young envoys to the Non-Chernozem Zone. This was an emotional event. The republic's Komsomol members, having taken up the torch of friendship and the brotherhood of the Soviet peoples from older generations, voluntarily, answering the call of the heart, hastened to provide their efforts and knowledge to the distant, but native, region. Participation in development of the Non-Chernozem Zone's productive forces became an intimate affair for the republic's workers, who made specific pledges to provide sponsorial aid to Ivanovskaya and Novgorodskaya oblasts. Uzbekistan's envoys set about building large specialized sovkhozes and construction industry enterprises. Some 23,000 hectares of reclaimed land were placed in use and 60,000 square meters of living area were built. An even higher level of sponsorial cooperation has been set for the 11th Five Year Plan.

Representatives of almost all union republics, as well as of Moscow and of a number of krays and oblasts in the Russian Federation, now are participating in the transformation of Russia's Non-Chernozem Zone. This is one of the brilliant manifestations of the immutable unity of the Soviet peoples, their mighty mutual support in solution of economic and social problems.

Collectives from Belorussia rightfully can be listed among those who made an especially weighty contribution to development of this important region. They are comprehensively upgrading the farms of Pytalovskiy Rayon, Pskovskaya Oblast and are reclaiming lands in seven rayons in Bryanskaya Oblast. Envoys from Kirgizia are building Kirgizstan Sovkhoz on Yaroslavl' land. Agricultural and construction organizations from Moldavia in the Udmurtskaya ASSR and from Lithuania in Smolenskaya Oblast made high pledges. Contractual work costing more than 170 million rubles has been accomplished by sponsors on Non-Chernozem Zone installations in 4 years of the five-year plan. Reclamation measures have been conducted over an area of 37,000 hectares and 56,000 hectares of drained and irrigable land have been placed in operation. Some 92,000 square meters of living area have been built for reclamation organizations alone.

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*[Reprinted in Tashkent PRAVDA VOSTOKA 20 Aug 80 p 1]

Naturally, the workers of the Non-Chernozem Zone in the main took upon themselves an enormous volume of work to elevate the economy of the countryside and are realizing the intended plans primarily through their own efforts. However, they thankfully accept the aid of friends. Today, aid is especially necessary since accomplishment of the program to upgrade the zone is lagging. Less reclaimed area than anticipated has been turned over for use. Timely turnover of production installations and housing is lacking in a number of places and farms often lack cadres. All of this still prevents achievement of the anticipated rates of growth of field and farm productiveness.

Considering the importance of the problems facing the Non-Chernozem Zone, sponsorial collectives see their goal being to more actively support the success of the transformations and to provide more substantial assistance to the countryside. They will strive to draw lessons from errors and to be more demanding upon themselves. However, this mood is not found everywhere. There are those who are not living up to their promises.

Collectives from Nikolayevskaya Oblast, for example, envisioned for the five-year plan accomplishment on Yaroslavl' farms of reclamation work costing 1.5 million rubles, turnover of 5,000 hectares of irrigable land, and construction of 30,000 square meters of living area. However, in 4 years only 400,000 rubles have been assimilated and, practically speaking, no land is being reclaimed or housing built. The pledges of collectives in Zaporozhskaya Oblast turned out not to be accomplished in several areas. Organizations from the Armenian, Azerbaijan, and Estonian SSR only have accomplished an insignificant volume of work. Subunits from Glavkuban'risstroy in Krasnodarskiy Kray annually fail to cope with tasking to build construction industry bases in the city of Torzhok.

The lag is explained to a great degree by the absence of requisite supervision over adherence to sponsorial discipline on the part of a number of ministries and departments and of party, Soviet, and economic organs. USSR Minvodkhoz [Ministry of Land Reclamation and Water Resourses], USSR Minsel'stroy [Ministry of Rural Construction], and Roskolkhozstroyob"yedineiye [All-Russian Association of Interkolkhoz Construction Organizations] did not provide organizations sent to the Non-Chernozem Zone capabilities for effective work and reacted poorly to signals about shortages and the poor state of affairs.

The workers of the Non-Chernozem Zone primarily await support in solution of the most pressing, urgent problems. The integrated, comprehensive nature of businesslike cooperation responds to this. It is fine when sponsors take upon themselves accomplishment of design work, reclaim land, build houses and production buildings, and assist in making installations operable. Along with this, some sponsorial organizations do not understand their role completely correctly. Thus, in 3 years of the five-year plan, workers from Volgograd allocated five K-700 tractors to Chuvash farms, while Tatar enterprises sent 20,000 meters of irrigation pipe to Gorkovskaya Oblast. Naturally, equipment is needed here, but it would be more valuable if local sponsors would lend a hand, would leave a noticeable mark on the transformed land.

A great deal of responsibility for successful cooperation falls to those who take in volunteer helpers. The visitors must be greeted warmly, surrounded by constant attention, and provided good conditions for labor and leisure time. Unfortunately, facts of a different kind are encountered. For instance, new worker replacements from Uzbekistan recently could not be received in Ivanovskaya and Novgorodskaya oblasts due to late preparation of their housing. At the same time, problems of hot food and domestic amenities were not solved. Labor organization leaves something to be desired.

Upgrading of the Non-Chernozem Zone is a question of enormous sociopolitical and economic significance. The duty of party organizations and of community is to insure successful work in every sector and more widely to deploy socialist competition in collectives for unconditional accomplishment of plans for transforming the zone. It is important continually to monitor the work of the sponsors, to provide timely assistance in discovering difficulties, and proficiently help in eliminating them.

Vigorous development of Russia's Non-Chernozem Zone has become a national cause. At present, its workers hand in hand with sponsors are preparing a worthy greeting for the 26th CPSU Congress. They recognize that the more substantial the labor contribution of each collective, the more significant the successes developing this region's economy and culture.

7869
CSO: 1824

AGRO-ECONOMICS AND ORGANIZATION

ENTERPRISE SUBSIDIARY FARMS IN THE NORTHEAST

Moscow PRAVDA in Russian 30 May 80 p 2

[Article by VASKhNIL Corresponding Member and Director of the Siberian Scientific Research Institute of Agricultural Economics V. Boyev: "Enterprise Agrarian Shops"]

[Text] Industrial enterprises and other organizations have subsidiary farms in a majority of the regions of the country. The history of their organization and operation has known its ups and downs. Today, we have every grounds for considering subsidiary farms to have passed the test of time. It is especially important to create and ensure the precise operation of such farms in regions of intensive industrial development in the European North, Siberia and Far East, where the harsh climatic conditions are aggravated by the shortage of labor reserves, territorial remoteness from developed foodstuffs producing regions, poorly developed transport, and a number of other circumstances. Their benefits are unquestionable. Let's cite several examples.

In Khanty-Mansiyskiy Autonomous Okrug, Tyumenskaya Oblast, where petroleum and gas extraction is being developed, five subsidiary farms have been organized. Enterprises of the Glavtyumenneftegaz quickly built 23 cow barns, calf pens and poultry coops, 70,000 m^2 of hothouses and other production, cultural and personal-services facilities. Thousands of hectares of natural fodder land was cultuvated.

Last year these farms obtained 1,500 tons of vegetables, 7,000 tons of milk, 460 tons of meat, 24.4 million eggs, and significant amounts of fish, berries and mushrooms, which was a very substantial contribution to improving supplies to oilfield workers and their families. In terms of cow and poultry productiveness and vegetable yields, they were 11-19 percent higher than the average indicators for agriculture in Tyumenskaya Oblast. By 1985, we plan to have increased vegetable and potato production here 1.4- to 1.8-fold. If orders for mineral fertilizers and equipment to mechanize vegetable and fodder crop cultivation and labor-intensive jobs in stockraising are met, the level of production of this output can be even higher.

Subsidiary farms of the Pevekskiy Ore Enrichment Combine, the Orotukanskiy plant, and the Atkinskiy and Palatkinskiy motor vehicle centers (Magadanskaya

Oblast) meet all the workers' whole milk needs and a large part of their meat and fresh vegetables needs. It is important to note that an almost smooth flow of fresh produce the year around has been achieved under exceptionally harsh soil and climatic conditions.

The subsidiary farms of the Noril'sk Mining and Metallurgical Combine have been in operation for years. They began small, with a couple of cows, a couple of dozen hogs and a small hothouse. The dairy herd here now exceed 1,000 head. Average annual milk yield per cow has reached 3,500 kg. Some 6,500 hogs are being fattened using food scraps from Noril'sk. In [illegible], about 700 tons of pork, 3,500 tons of milk and a thousand tons of vegetables (grown in enclosed areas) was obtained on the combine's subsidiary farms. All this produce was clearly better than what was being brought in.

Some 2,000 km from the combine, the enterprise built "Tayezhnyy" Sovkhoz. Here, they not only produce and send large amounts of agricultural output down the Yenisey, but they have also made the sovkhoz a recreation area for workers and their families.

Pashinskoye Subsidiary Farm in Ovosibirskaya Oblast, which is led by V. Lagunnikov, produces sufficient meat, milk, vegetables and potatoes to meet the needs of many thousands of people. In terms of production intensiveness and efficiency, this farm is one of the leaders both in the oblast and in all of Western Siberia. Average annual profit over the last nine years has been 629,000 rubles here.

The examples given bear convincing testimony to the fact that the organization of food shops is justified by quite a few benefits. The additional output obtained right from the fields or farm is delivered right to the consumers, without any transshipment.

Moreover, when their management is approached correctly, these shops can be of substantial assistance to workers and employees in developing their own personal subsidiary plots, in developing collective gardening and horticulture, through the sale or transfer of seeds, plantings, young livestock and feed, in cultivating and fertilizing the land and doing a number of other jobs, including help in selling surplus produce obtained on household plots. In many instances, the creation of subsidiary farms enables us to involve family members and other contingents of the population in socially useful labor.

It goes without saying that the organization of industrial enterprise subsidiary farms not only does not exclude, but rather even assumes the appropriateness of creating specialized agricultural enterprises of the Ministry of Agriculture, especially poultry and dairy farms and feed lots and hothouse combines, and especially near rapidly growing, large industrial centers.

Food shop work experience convinces us that they operate more successfully the more concern for them is displayed by the leaders of industrial enterprises, party organizations and plant committees. Unfortunately, we still encounter quite a few public organization leaders who are doing little to use food scraps, excess heat, energy and even labor resources, to obtain a portion of their food and to reduce expenditures on storing, shipping and marketing food. That is a peaceful way to live, of course, and one can blame others for shortcomings in the supply of foodstuffs. For a long time, disorder in financing subsidiary farms and supplying them with materials and equipment necessary to develop agricultural production was an important factor retarding the development of the subsidiary farm.

In view of the importance of organizing agricultural production on the subsidiary farms of industrial departments, the CPSU Central Committee and USSR Council of Ministers have adopted a special decree "On The Subsidiary Farms of Enterprises, Organizations and Institutions" which has opened up a wide road to developing this work of such importance to the national economy. The decree puts forward the basic principles for organizing and operating such farms and establishes a precise procedure for providing them with land, graded seed, plantings, young breeding livestock, veterinarian and other services.

Beginning this year, when developing plans for the distribution of material and technical resources we have anticipated allocating subsidiary farms, regardless of departmental subordination, tractors, combines, mineral fertilizers, agricultural machinery, equipment and spare parts under the exact same procedures established for kolkhozes and sovkhozes. The allocation of capital investments and material-technical resources needed to develop subsidiary farms is done by the appropriate ministries and departments through the funds and [credit] limits allotted them for their basic activity. A system of calculations for the output obtained has been set up.

Proper use must be made of all opportunities for organizing and improving the operation of subsidiary farms; this work must be placed under party and public supervision. These farms must not only play a useful role in improving foodstuffs supplies, but they must also facilitate using production resources more fully.

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AGRO-ECONOMICS AND ORGANIZATION

AGROINDUSTRIAL COMPLEXES IN THE NORTHEAST

Moscow STROITEL'NAYA GAZETA in Russian 29 Jun 80 p 2

[Article by Irkutskaya Oblispolkom Deputy Chairman [illegible]manov: "Siberian Agro-Complexes"]

[Text] Agricultural output has until recently been brought in in significant amounts from other regions of the country to Irkutskaya Oblast, with its developed industry. Comrade L. I. Brezhnev, CPSU Central Committee General Secretary and USSR Supreme Soviet Presidium Chairman, set the task of supplying workers solely with locally-grown vegetables, milk and meat during his visit to Irkutsk. We are faced with fundamentally restructuring agricultural production, with increasing produce output quickly.

The CPSU obkom and oblispolkom, jointly with specialists, have outlined a number of measures to develop the industrial base of agriculture. Large construction-installation subunits engaged in industrial construction have been enlisted to help RSFSR Ministry of Agriculture organizations and the Roskolkhozstroy. We adopted a policy of building large agricultural complexes alongside the industrial centers of Irkutsk, Usol'ye-Sibirsk, Zimaya, Bratsk and Ust'-Ilimsk along with building new stockraising premises on kolkhozes and sovkhozes.

This decision makes a lot of sense. First, an opportunity is created for using sources of electric power, heat, utilities and purification facilities at industrial enterprises in the interests of agriculture. Second, after an agricultural complex has been put into operation, it is easier to staff it with operating personnel and to set up the delivery of agricultural output to the city.

Construction of one such large agro-industrial complex is complete, the Usol'skiy. It includes a hog-raising combine for 108,000 head, a poultry farm for 920,000 layer hens, a duck farm, three hectares of hothouses. The agricultural complex was modeled after the industrial center. A town with all the amenities was built for its 7,000 workers.

An agro-industrial complex is being put up quickly near Irkutsk. A poultry farm for 450,000 layer hens, a poultry breeding farm and a six-hectare hothouse combine are already in operation. We plan to put again as much hothouse area into operation this year. Construction of an agricultural town has begun.

The outlines of the Bratsk agro-industrial complex are also visible. A 10-hectare hothouse-greenhouse combine is already ready, and the poultry farm is being expanded from 140,000 to 800,000 layer hens. A site has been prepared for building a hog-raising combine for 108,000 head. A hothouse combine's foundations have been laid at the Ust'-Ilimsk agro-industrial complex.

Twenty dairy complexes with capacities of 400 to 1,200 head each and three sheep complexes have been built on oblast kolkhozes and sovkhozes in the vicinity of other oblast cities.

We have set ourselves the goal of building high-quality facilities, so that operations personnel can utilize planned capacities quickly. That goal is being reached. As a result, the Ptitseprom Trust, for example, has increased sales of eggs to the state from 387 million in 1977 to 500 million in 1979, and sales of poultry meat have increased respectively from 9,900 tons to 13,500 tons. The trust of vegetable-growing sovkhozes which unite the new hothouse combines is providing workers of Irkutsk, Bratsk and Usol'ye-Sibirskiy with fresh vegetables the year around. The "Pursey" hothouse combine, which was built in Bratsk by a collective from the Bratskgesstroy administration, is working especially productively. Here, they did not limit themselves to growing cucumbers and tomatoes, but have given our area fresh water- and other melons and field mushrooms for the first time. Even while capacities were being mastered, Bratsk vegetable growers were achieving good results, for which they were awarded the Challenge Red Banner of the RSFSR Council of Ministers and the AUCCTU.

Nearly all production processes are mechanized at the new agricultural enterprises, and good conditions have been created for the workers. This has ensured high labor productivity.

The new stockraising and vegetable-growing complexes are rapidly gathering strength, and their construction continues on a broad front. But not everything is going smoothly. We have not managed to always provide the new complexes with highly skilled specialists. For this reason, there have been delays in mastering the planned capacities of a number of production facilities.

We are waiting for new technical resolutions from the designers and planners, in particular for collecting and utilizing fertilizer at large hog-raising combines and poultry farms. The RSFSR Ministry of Agriculture has not approved technical documentation for a number of hog-raising combines and poultry farms, as it contains obsolete technical resolutions. That is proper, of course, but the customer is not providing new plans.

The equipment delivery system is not set up properly. Last year, the Irkutskpromstroy Trust failed to meet obligations for putting new hothouse combine capacities into operation for this reason. Equipment deliveries to this project continue to be delayed.

The construction of agricultural enterprises could be accelerated were we to use not heavy reinforced concrete but lightweight, modern components. As strange as it might seem, in our wooded oblast, neither the RSFSR Ministry of Rural Construction nor the Roskolkhozstroy has or is creating capacities to produce wood panels for housing or laminated components, although large amounts of unprocessed wood are exported out of the oblast, including by the above-indicated departments. At the same time, rural areas are finding that housing and civil construction are lagging as compared with the scope of construction of agricultural complexes.

11052
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AGRO-ECONOMICS AND ORGANIZATION

SUBSIDIARY FARMS AT AVIATION INDUSTRY ENTERPRISES

Moscow TRUD in Russian 13 Aug 80 p 2

[Article by G. Al'bov, Chairman of the Aviation Industry Workers Trade Union Central Committee: "Subsidiary Farms -- Advantageous for Every Plant"]

[Text] The subsidiary farms of industrial enterprises are of considerable assistance in further improving the provision of workers with food. The resolutions of the July (1978) CPSU Central Committee Plenum and the CPSU Central Committee and USSR Council of Ministers Decree "On Subsidiary Farms of Enterprises, Organizations and Institutions" have played an important role in their development.

In aviation industry, 25 associations and enterprises have their own large subsidiary farms. Each year they produce about 5,000 tons of meat, 10,000 tons of milk, 35 million eggs, 8,000 tons of potatoes, and 4,500 tons of vegetables and other produce. During the first four years of the five-year plan alone, meat production on the farms increased by 25 percent, milk production -- by eight percent, and egg production -- by 10 percent. The number of head of cattle on them is 10,000, and the number of hogs -- about 23,000.

Practically all the output produced reaches the public catering network of the enterprises and organizations, and the output of many subsidiary farms adds significantly to the centralized stocks allocated for public catering. The subsidiary farms provide children's preschool institutions, hospitals and dispensaries with all the milk and eggs they require and those working in sectors with hazardous working conditions with all the milk they require. In a word, the work experience of the branch's best farms demonstrates the unquestionable advantages of developing them further.

In view of this, we are paying a great deal of attention to the subsidiary farms. For example, during the first four years of the five-year plan, they were allocated 158 tractors and 42 grain combines. The mechanization of labor-intensive jobs, improving production technology and creating conditions in which people's labor will be highly productive have wholly and fully justified themselves. Subsidiary farms already have available to them more than 1,500 pieces of different kinds of agricultural machinery, including feed dispensers, conveyors, feed shop equipment, milking machines and units for preparing vitamin-enriched grass meal. In the 11th Five-Year Plan, the farms will be allocated 500 tractors and more than 70 grain harvesters. The subsidiary farms annually harvest more than 14,[illegible]0 tons of grain, and on some of them the grain yields exceed 30 q/ha. Increased [illegible] production enables the subsidiary farms to basically provide their own farms with high-quality feed. Incidentally, particular attention is being paid to this problem.

Particularly valuable here is the experience of subsidiary farms of the Rybinskiy Engine-Building Production Association and the Ufa Engine-Building Production Association, which have through their own efforts equipped modern feed shops and fully solved the problem of feed to fatten hogs by making active use of food scraps, collecting more than 4,000 tons each year.

The trade-union central committee is currently working out long-range plans for developing subsidiary farms. Thus, the farm of the Rybinskiy Engine-Building Production Association plans to supplement existing capacities by building new ones, developing the warehouse and energy systems, and improving worker living conditions. Last year, it put into operation a hothouse which ensures the production of 250,000 tons of vegetables per year. They have built an administrative facility with a club and dining hall, and a workshop to repair agricultural equipment. They plan to finish building a pig sty for 600 head and two structures for raising 16,000 broiler chicks by the end of the year.

On this subsidiary farm, much attention is paid to improving housing and living conditions for the workers: this year, a children's combine with places for 70 children and a 12-apartment unit will be opened. It should be noted that the association is doing all the construction to develop the subsidiary farm (more than three million rubles worth of capital investments) through its own efforts, using USSR Gosbank loans and a maximum of its own internal reserves. In 1978-1979, about 1.5 million rubles was utilized. At present, farm assets are about six million rubles.

In carrying out the resolutions of the July (1978) CPSU Central Committee Plenum, the trade-union central committee has set associations and enterprises specific assignments on further developing the production of agricultural output. We plan to bring the number of subsidiary farms up to 85 by 1985. We are currently organizing 21 farms, on which we are building stockraising complexes, hog farms and hothouses.

Implementation of the measures planned, fuller use of branch enterprise and association opportunities for creating subsidiary farms, mechanizing agricultural jobs, and also reclamation and chemization will enable us by 1985 to have more than doubled last year's production of agricultural output and to significantly improve public catering and the provision of branch workers with foodstuffs.

The creation of new farms and the development of existing ones is going full steam ahead, although there are still various organizational and technical difficulties. In order to overcome them successfully, we have planned steps to exchange experience extensively, based on the leading farms; we are holding seminar-meetings and have concluded cooperation agreements with agricultural scientific research institutes.

However, we have a different kind of problem as well. Several ispolkoms of local Soviets of People's Deputies are delaying the allotment of land to enterprises and organizations wanting to create subsidiary farms. Goskomsel'khoztekhnika rayon departments allot them machinery after all others.

All this naturally hinders the development of subsidiary farms which, as many years of experience at many enterprises have shown, have become a reliable help in providing workers and employees with food. It is now extremely important that everything necessary be done to make the tables of branch workers richer and more diverse, through the joint efforts of the administration, party, trade-union and Komsomol organizations of associations and enterprises.

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11052

TILLING AND CROPPING TECHNOLOGY

ADVICE ON PREPARATIONS FOR ABUNDANT CROP IN 1981

Kishinev SOVETSKAYA MOLDAVIYA in Russian 8 Aug 80 p 2

[Article from NPO "Selektsiya": "A Firm Foundation for the '81 Harvest"; passages enclosed in slantlines printed in boldface]

[Text] There are 35-40 days left before the beginning of the optimal time periods for planting winter crops, and there is still much to be done in connection with preparing the soil and seeds well.

/Predecessors and Soil Cultivation/

Under Moldavian conditions the best predecessors for winter wheat are annual grasses, corn mixed with soy beans for green fodder, alfalfa that is gathered after the first mowing, peas for grain and stubble fields.

When there is enough rain in the autumn one can obtain good yields of winter crops after corn that is harvested for silage and grain, sunflowers and even sugar beets that are harvested at early times.

The effectiveness of nonfallow predecessors can be increased by applying efficient means of cultivation and providing for maximum accumulation and retention of moisture in the soil.

When planted after nonfallow predecessors on fields with no perennial suckering weeds, the largest yields of winter wheat are obtained when the soil is loosened to a depth of 8-12 centimeters instead of subsoil tilling.

The additional yield from this kind of cultivation of the soil amounts to 2-4 quintals per hectare, and in dry years the difference brought about by this kind of loosening reaches 6-10 quintals and more.

The preparation of the soil after occupied fallow and nonfallow predecessors, except for spike crops, consists in that after discing it is loosened to a depth of 8-12 centimeters with immediate cultivation of the soil disc and tooth equipment until it is in a condition that is suitable for planting. With loose soil one need not do more than disc with heavy harrows twice, with simultaneous use of tooth harrows. Subsequently the soil is cultivated or harrowed as precipitation falls and the shoots of weeds appear. This year when by harvesting time a good deal of moisture had been accumulated on fields with occupied fallow crops and peas and there is frequent precipitation, one can also plow. In these cases it is necessary, after harvesting, to conduct soil scuffling with subsequent plowing with plows with skim coulters to a depth of 20-22 centimeters in combination with lug ring rollers or harrows. If the soil is not prepared well enough, after plowing one should harrow one or two times or use disc cultivators in combination with harrows. Subsequently, as weeds appear, the soil is cultivated with harrows, and harrowing is done after there has been precipitation.

In recent years large areas have been planted in winter wheat after perennial grasses. Here the soil cultivation should begin with discing to a depth of 5-7 centimeters and plowing should be done to a depth of 25-27 centimeters. The latter must be done with skim coulters and in combination with harrows.

After corn, sunflowers and sugar beets it is necessary to do discing instead of plowing, and then the soil should be loosened only to a depth of 8-12 centimeters with simultaneous cultivation with discs and tooth harrows.

When winter crops are planted after earlier winter crops and spring spike crops, in order to avoid the proliferation of carabids and other pests and diseases, one should quickly gather the straw and immediately dress the soil. In order to provide for good preparation of afterharvest residuals which provide a favorable environment for the development of pests and diseases, it is expedient to plow to a depth of 20-22 centimeters with the simultaneous use of rollers or harrows.

Taking into account the great delay in the harvesting of predecessors, it is important now to allow time to pass between harvesting and subsequent preparation of the soil.

/Fertilization/

An indispensable part of the technology of cultivating wheat is efficient utilization of fertilizers. They produce the greatest effect when they are applied taking into account the predecessor, the level of fertility of each specific field, and the biological peculiarities of the strains that are being cultivated.

In order to obtain 50 and more quintals of wheat per hectare with a 14-percent protein content and 27-28 percent gluten, it is necessary to apply 90-150 kilograms of active substance of nitrogen, 60-90 of phosphorus and 30-90 kilograms of potassium. Doses of 150 and more kilograms of nitrogen should be applied to low-growing strains of the Pitikul type and also when cultivating the Odesskaya-51 and Dnestrovskaya-25 strains on less fertile soils after crops that are harvested late and spike crops.

It is most expedient to apply the full dose of phosphorus and potassium fertilizers and also 30-60 kilograms of nitrogen fertilizer per hectare with the basic cultivation of the soil, depending on the quality of the predecessors. The rest of the nitrogen (60-90 kilograms) should be applied during the spring and summer growing period. This distribution of nitrogen fertilizers makes it possible, in particular, to form high quality grain.

/Strains, Planting Times and Planting Norms/

For the 1981 harvest the main areas of winter wheat in Moldavia will be planted with the regionalized strains Odesskaya-51 and Dnestrovskaya-25. The Zaporozhskaya ostistaya, Eritrosperum-127 and the promising short-stalked Pitikul strain will also be planted.

Odesskaya-51, which is distinguished by high plasticity but is not sufficiently to lodging, should occupy areas after late predecessors and also sloping and more eroded sections where there is no danger of lodging.

Dnestrovskaya-25, Zaporozhskaya ostistaya and Eritorosperum-127, which are relatively resistant to lodging, can be planted on more fertile land after early predecessors that provide moisture.

One should emphasize that the Eritrosperum-127 strain sheds its grain if it is not harvested soon enough and therefore one should plan to harvest the areas planted in it first.

The Pitikul strain which is resistant to lodging should be planted on low, flat areas where there is irrigation and large doses of fertilizers are used. This kind of differentiated approach to distributing strains makes it possible to avoid practically all lodging of grains and to utilize fertilizers more efficiently.

Modern strains are very sensitive to planting times. Both very early planting times and especially late ones lead to shortages in the harvest of the crop.

When there is sufficient moisture in the soil the largest grain yields are produced here when we plant wheat between 10 and 25 September. Moreover, with a failure to plant at the optimal times, the yields are reduced least with Odesskaya-51, and Dnestrovskaya-25 and Zaporozhskaya ostistaya produce the largest yields when they are planted in moist soil from 15 through 25 September.

If the weather is hot and dry before the optimal planting times and there is a danger that the moisture will be lost from the upper planting layer of the soil on certain fields, they should be planted 6-8 days ahead of the schedule for the Odesskaya-51 strain.

Areas that are planted extremely early, as a rule, are severely infested with diseases and pests, do not withstand the winter as well and, naturally, produce less than the possible yield. Only in individual favorable years can areas that are planted late (the second and third 10-day periods of October) produce a relatively good yield of grain.

When the quantity of moisture is not sufficient to obtain vigorous shoots it is better to wait until a good amount of precipitation falls in order not to cause "provocation" of the shoots and cause them to die off. But if there is to be no precipitation it is better to plant the crops in dry soil during the first 10 days of October and to increase the planting norm by 15-20 percent. It is not expedient to plant the short-stalked Pitikul strain after the optimal time periods.

When planting at the optimal times the planting norm for the Odesskaya-51 strain is 4.5 million germinative seeds per hectare and for Dnestrovskaya-25 and Zaporozhskaya ostistaya -- 5 million per hectare.

The Pitikul strain forms the largest yields when 6-7 million germinative seeds are planted with narrow-row or cross sowing. The depth of the placement of the seeds for the high-stalked strains is 5-6 centimeters and for the Pitikul strain -- 4-5 centimeters.

The regionalized strains of winter barley, Start, Odesskiy-46, Yarna and Zavet-3 produce large yields when planted between 15 and 30 September and even in the first 10 days of October with a planting norm of 4.5-5 million germinative seeds per hectare.

It is best to plant winter rye and mixtures of it for green fodder during the third 10 days of August. The planting norm for pure rye is 4-4.5 million germinative seeds, and when it is mixed with winter vetch -- 80-100 kilograms of vetch and 50-80 kilograms of rye per hectare.

/With Irrigation/

The optimal time periods for planting wheat on irrigated land come 8-10 days later than on nonirrigated land. In the northern and central zones they are 20-30 September and in the southern regions -- from 25 September through 5 October. The permissible time periods last until 10 and 15 October, respectively.

The planting norm is 4-4.5 million seeds per hectare at the optimal times and 6-6.5 million at the later times.

The soil is prepared for the winter crops in the same way as it is on nonirrigated land.

Fertilizers are applied at the same time as the main preparation of the soil is being done as follows: after pulse precedessors and mixtures of them on noncarbonate chernozem soil -- 45-60 kilograms of nitrogen, [illegible] of phosphorus and 40-50 kilograms of potassium (active substance) per hectare; on carbonate soils -- 60-90 kilograms of nitrogen, [illegible] 90 of phosphorus and 40-50 kilograms of potassium; after nonpulse predecessors on noncarbonate chernozem -- 90-120 kilograms of nitrogen, 90-120 of phosphorus and 40-50 kilograms of potassium; on carbonate soils -- 120-150 kilograms of nitrogen 60-90 of phosphorus and 40-50 kilograms of potassium (active substance) per hectare.

The preplanting irrigations of winter wheat are conducted after the early predecessors, beginning 8-10 and ending 2-3 days before planting, with an irrigation norm of 400-600 cubic meters in the northern zone and 800-1,000 cubic meters in the southern zone. Post-irrigation harrowing or cultivation with a harrow is mandatory.

Post-planting irrigations are conducted when the planting times are late. The irrigation norms are reduced to 300-400 cubic meters in the northern regions and 500-600 in the southern regions.

/Protection From Pests and Diseases/

The conditions of the 1980 summer are extremely favorable for the development of winter moths and therefore after harvesting peas and other pulse crops it is necessary to keep the fields clear of weeds. One of the cultivations should be done during the period when the pest is engaged in mass egg laying.

The planting of winter crops after other winter crops leads to a sharp increase in the number of grass flies and grain carabids as well as infection with root rot, powdery mildew and other diseases. In order to reduce their effect on the wheat, the cultivation of the soil to a condition suitable for planting should be completed 35-40 days before the optimal time periods.

Winter crops cannot be planted on stubble for more than 2 years in a row. To combat smut, fusarial wilt and bacterial plant disease, one should treat the seeds with toxic chemicals, moistening them with 5 liters of water per ton of seeds. In order to increase the effectiveness of the treatment one should add to the water silicate or flour paste in an amount of 150-200 grams per ton. The norm for the expenditure of disinfectants should be in keeping with the recommendations for 1979.

The treatment of winter barley seeds that are infected with loose smut should be done 4 days before planting with vitavaks or fundazol (benomyl). The treatment with TMTD and granozan is done 3-4 weeks before planting.

All areas planted in winter crops should be checked for the presence of soil-dwelling pests. When there are more than 2-3 caterpillars of winter moths or larvae of grain carabids per square meter the soil should be dusted with a 12-percent GKhTsG powder (20 kilograms per hectare) and the preparation should be plowed under immediately.

During the period when the shoots appear it is necessary to treat the planted areas around the edges with a 12-percent GKhTsG powder (20 kilograms per hectare) or to sprinkle with chlorophos (1 kilogram per hectare) and also with metaphos (1.5 kilograms per hectare).

If at the same time the fields are infested with winter moth or grain carabid all of the shoots are dusted twice. Two complete treatments are also done on areas that have been planted after winter spike crops.

11772
CSO: 1824

TILLING AND CROPPING TECHNOLOGY

PREPARATION OF UKRAINIAN FIELDS FOR WINTER CROPS

Kiev PRAVDA UKRAINY in Russian 20 Aug 80 p 1

[Editorial: "The Winter Crop Fields"]

[Text] The agricultural workers have many concerns during these August days. The difficult grain harvest is nearing completion. Feed procurement operations are in progress. The farmers are striving to carry out the work as part of an overall complex of operations and to supply the homeland with as much grain and other field products as possible. At the same time, the fields to be used next require an increasing amount of attention. The bricks are presently being laid out on the winter fields for the wonderful edifice we refer to as the harvest.

The agricultural workers realize that the harvest must be rich and complete. Indeed, not only the year 1981 but the entire Eleventh Five-Year Plan as well are dependent upon the harvest. In a speech delivered before the July (1978) Plenum of the CPSU Central Committee, Comrade L.I. Brezhnev stated: "The task has been assigned of raising the cropping power of the grain crops during the next five-year plan to an average of 20 quintals per hectare for the country as a whole and to 40 or more quintals of grain per hectare for such regions as the north Caucasus, the Ukraine, Moldavia, Belorussia, the Baltic area and others." In achieving this goal, special importance is being attached to the winter grain crops, since they are more responsive to the concern being manifested by the plowing personnel and more resistant to changing weather conditions.

The party organizations in the various areas are doing everything possible at the present time to ensure that the high labor enthusiasm generated by the preparations for the 26th CPSU Congress and embodied in the harvest successes will be continued without respite during the next stage in the summer complex of field operations.

The first and most urgent task is that of sharply accelerating the soil preparation work and participating, in a spirited manner, in the sowing operations. Since the grain crops ripened later this year, the delayed harvest served to attach greater importance to the element of time. The faster the fields are cleared of the post-harvest residues, the broader will be the front of operations being carried out by the plowing and other units of equipment and the more confidently the grain growers will proceed with their sowing operations.

In accordance with the agrotechnical requirements, during normal years the soil must be prepared 20 and at times 30 days prior to the commencement of the sowing work: it must receive additional moisture and acquire a good structure. Today such opportunities are limited. Thus more extensive use must be made of the advantages offered by surface cultivation of land. In those areas where the harvest operations are continuing, the work must be organized according to the principle: harvest the grain during the day and prepare the soil at night.

Khersonskaya, Donetskaya and Odesskaya oblasts are good examples. Here 64-70 percent of the planned areas have already been prepared for the winter crops. At the same time, no justification can be found for the intolerable delay that has taken place in plowing operations in Zhitomirskaya, Ternopol'skaya, Chernigovskaya oblasts. As of the moment, less than one third of the winter fields have been plowed in these oblasts.

On many farms, during the course of organizing the sowing work, a decision was made to employ the fully justified Ipatovo method, which makes it possible to carry out the field work as part of an overall complex of operations. At the same time, opportunities are being sought for improving the structure of the grain plantings. This is in keeping with the basic interests of the entire rural economy. However, in carrying out this important work, special importance is attached to avoiding stereotyped actions and hasty decisions so as not to cause harm to the scientifically sound systems of farming or to the overall culture of production. In the southern regions of the republic, those which are most susceptible to drought conditions, special importance is attached to defining the optimum size of the fallow fields in a creative manner and in keeping with the future requirements.

The sowing of the winter crops is by no means a simple process. It requires the leaders and specialists of kolkhozes and sovkhozes to display flexibility in solving the technological problems. Here we have in mind such problems as the sowing periods and sowing norms, the depth of seed placement and other methods employed in the agrotechnical complex of operations. The agronomists bear special responsibility. The fate of the future harvest is dependent upon their knowledge, experience, ingenuity and efficiency. Any delays, similar to excessive haste and fussiness, are intolerable. The recommendations handed down by scientists must be followed in a strict manner and the work must be carried out based upon a specific set of conditions. For their part, the scientific workers and especially workers attached to state oblast agricultural experimental stations must not only provide overall recommendations but in addition they must furnish assistance to the farmers in the various areas in the form of specific advice for determining the methods to be employed.

The local party organizations are obligated to support the specialists and scientists in every possible way as they carry out their creative endeavors and to deal very strictly with those who fail to display useful initiative or fall behind the course of events. In addition, a good working atmosphere and a healthy spirit of concern for the future harvest must also be maintained on the farms and especially among the machine operators.

Cropping power is dependent to a considerable degree upon the condition of the seed stock. On a majority of the kolkhozes and sovkhozes and despite the well known difficulties, the specialists have undertaken all of the measures required for creating such stock in the volumes needed and for achieving high quality seed stock. For example, the farms in [illegible] Dnepropetrovskaya, Krymskaya and Khar'kovskaya oblasts have already completed their plans for laying in seed and they are presently striving to raise it to a high sowing condition in a rapid manner. In addition, there are oblasts -- Ternopol'skaya, Volynskaya and a number of others - where not only is seed being stored away in a poor manner, but in fact it is being placed in storage with no check on quality being carried out.

The task consists of raising the tempo of the seed storage work, ensuring around-the-clock operation of the grain cleaning machines and improving the seed to the best sowing condition. By no means is this new work for the agronomists. However, mention should be made of one well known truth: seed grain is a special grain and should never be mixed with commodity grain. And where this truth is overlooked, proper order is lacking on the farms and on the thrashing floors.

Another large reserve for increasing grain production is that of utilizing fertilizer in the correct and scientifically sound manner. Today our farms have adequate quantities of mineral fertilizer at their disposal for applying a complete norm in behalf of the winter crops. Special attention must be given to making maximum use of the organic fertilizer supplies. In combination with chemical fertilizers, these organic materials as a rule serve to ensure that high yields will be obtained. In short, the work must be carried out so as to ensure that the entire arsenal of substances required by the land is applied to it in an intelligent and scientific manner.

The sowing of the winter crops serves as a serious test for the rural party organizations and as a check upon their fighting spirit and their ability to lead collectives in the campaign to bring in the future harvest. In directing this campaign, they must make maximum use of one powerful means for accelerating the work and for achieving strict control over quality -- a socialist competition. During the sowing period, the communists must enliven the mass-political work campaign and they must direct all of their knowledge and organizational experience towards solving the overall task: carrying out the sowing of the winter crops as rapidly as possible and in a high quality manner.

This present sowing campaign represents a very important stage in the overall program aimed at bringing in the harvest of the first year of the Eleventh Five-Year Plan, the year of the 26th CPSU Congress.

7026
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TILLING AND CROPPING TECHNOLOGY

ADVICE ON PREPARATION OF SOIL FOR WINTER CROPS

Kiev PRAVDA UKRAINY in Russian 23 Aug 80 p 3

[Article by F. Popov, doctor of Agricultural Sciences and A. Maliyenko, candidate of Agricultural Sciences: "Soil Preparation For the Winter Crops"]

[Text] Winter grains, primarily winter wheat, predominate in the gross yields of grain being obtained in the Ukraine. The principal prerequisite for good preservation of the winter crops and their high productivity is that of obtaining timely and complete seedlings, normal autumn development and deep rooting of the plants. An entire complex of agrotechnical and organizational measures, employed during the pre-sowing period, must promote the creation of these conditions.

During normal years in the Steppe zone, the best soil conditions, those which conform with the biological characteristics of the winter crops, are created on bare fallow. Following non-fallow predecessor crops and during arid years following occupied fallow, a preference is shown for surface non-mouldboard tilling using disk or flat-cutting implements to a depth of 8-10 centimeters. With such tilling, the deficit of moisture is less serious. Shallow plowing to a depth of 14-16 centimeters, especially on weedy tracts, is also effective following stubble predecessor crops.

In the forest-steppe zone and on occupied fallow, plowing should ideally be carried out in behalf of winter crops to a depth of no more than 20-22 centimeters, using harrows and rollers. This work must precede the shallow plowing of a field immediately following the harvesting of an occupied fallow crop. Following peas and silage corn, the principal method is that of surface tilling using disk, flat-cutting or plowing implements to 8-10 or 10-12 centimeters and with the soil being improved to sowing condition. Slotting of the soil on slopes is effective for winter crops, especially those sown following surface tilling.

In regions of adequate moisture (the forest district and western oblasts), the principal soil preparation method for winter grain crops is plowing to a depth of 16-18 centimeters. Surface tilling using disk or plowing implements is justified here during arid years following non-fallow crops, especially late predecessor crops.

This year, owing to the delayed spring period and insufficient warmth, the growth and development of all of the crops were delayed considerably. Thus the harvesting of the stubble and pulse predecessor crops in a number of areas has been delayed considerably. In particular, the corn is very slow in developing. The harvesting of corn for silage has for all practical purposes not yet commenced on farms in the northwestern and western and it is only commencing in the remaining regions. In view of the fact that on many farms no more than 2 weeks remain before the onset of the optimum sowing periods for the winter crops, the completion of the harvesting of all of the predecessor crops must be accelerated in every possible way, especially in the northwestern regions, and the harvesting of corn on the areas intended to the winter crops should be started immediately, so as to make it possible to complete the soil preparation work at least 10 days prior to the optimum sowing period.

The experience of leading farms and the data of scientific institutes testifies to the following: a delay in the harvesting of the predecessor crops and, it follows, the soil preparation work carried out during the worst agrotechnical periods, brings about a considerable reduction in the cropping power of the winter crops. This year, in all zones throughout the republic, a maximum amount of attention must be given to shortening the soil preparation periods by employing progressive tilling methods involving the use of disk, flat-cutting and other soil cultivation implements.

In the steppe zone, non-mouldboard (surface) tilling following non fallow predecessor crops, including stubble crops, continues to retain its importance even today. According to data supplied by experimental institutes throughout the zone, for the surface tilling of a stubble predecessor crop a preference is shown for disk implements, since greater damage may be inflicted upon winter crops by pests and diseases when use is made of flat-cutting implements.

In the forest-steppe zone, owing to time limitations, maximum use should be made of surface tilling, in addition to plowing, using disk, flat-cutting and plowing implements.

At the same time, consideration must be given to a typical feature of this year's season -- the high degree of weediness on many fields, especially those occupied by silage corn. Surface tilling should not be employed on fields contaminated by perennial weeds. Nor is it desirable to employ this method on fields that are strongly contaminated by annual weeds, since the shallow placement of a large quantity of organic bulk directly prior to sowing brings about a deterioration in the physical properties of the sown layer and disrupts the nutritional regime of the soil. In such instances it would be more effective to employ deep (to 14-16 centimeters) plowing, with soil packing carried out against a background of preliminary disking.

In the forest district and in the western regions of the Ukrainian SSR, surface preparation of soil is not being employed extensively following corn for silage or other late predecessor crops. At the same time, experimental data testifies to the fact that, under the conditions being experienced this year, surface tilling carried out using disk or plowing implements is fully justified in those areas where there is little weediness on the fields.

Just as in previous years, winter crops will be sown following stubble predecessor crops on considerable areas in the forest-steppe zone and the forest district. These predecessor crops are considered to be the least favorable -- owing to an unsatisfactory nutritional regime and unfavorable phytosanitary condition of the soil. This year, owing to considerable lodging of the grain crops, there is a raised amount of post-harvest residue materials. Thus extreme importance is being attached to creating favorable conditions for their normal decomposition. The stubble and other post-harvest residues must be thoroughly milled using disk implements and plowed under using nitrogen fertilizers at the same time. Moreover, an interval of 7-8 days should be observed between shallow plowing and deep plowing -- in those areas where the schedules and moisture condition permit this to be done.

Since extensive use is being made of non-mouldboard tilling in all zones, it should be remembered that this method is sufficiently effective for a generally high culture of farming. Winter crops sown following surface tilling are more sensitive to a reduction in soil fertility and to a raised level of soil weediness. Since an increase in the weediness of plantings is possible when surface tilling with disk or flat-cutting implements is employed, the use of this agrotechnical method should be combined with the use of herbicides. When it is carried out following all of the predecessor crops, the condition of the soil must be improved so as to ensure the placement of the seed at the optimum depth.

Various soil cultivation implements are employed for surface tilling: disk shallow plows -- LDG-5, LDG-10, LDG-15; disk harrows -- BDT-7, BD-10, BDT-3, BDS-3.5; share scufflers -- PPL-5-25, PPL-10-25; cultivator-sweeps -- KPZ-3.8, KPSh-5, KPSh-9.

The disking is carried out in several passes, in crosswise directions and with the tilling depth subsequently being increased from 4-6 to 8-10 centimeters. In order to create a level sowing bed, cultivation is carried out to a depth of 6-8 centimeters using sweeps and following the disking work. High quality pre-sowing cultivation work is also ensured here through the use of BIG-3 needle-shaped harrows.

When surface preparation of the soil is carried out using flat-cutting implements, disk shallow plows or needle-shaped harrows should ideally be employed on the fields. Flat-cutting cultivation is best carried out using needle-shaped harrows and rollers. Subsequently, the fields should be prepared for sowing.

This year, taking into account all of the soil preparation methods and periods, special attention should be given to the packing of the soil, since there is no basis for expecting an optimum soil structure as a result of natural packing. All of the plowing units must be equipped with rollers. Packing of the soil will be effective even after surface tilling and especially following the use of shallow plows or heavy duty disk harrows. The effectiveness of soil packing is higher when the interval between the principal cultivation operation and the sowing of the winter crops is shorter.

Presowing cultivation is usually carried out using cultivators. The use of wide-cut units consisting of heavy duty spike tooth harrows on plowed areas for the purpose of accelerating the preparation of the soil is fully justified.

The creative use of scientific achievements and leading experience will make it possible for the agricultural production workers, despite the complicated conditions being experienced this year, to establish a strong foundation for obtaining high winter crop yields during the first year of the Eleventh Five-Year Plan.

7026
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KAZAKHSTAN BUCKWHEAT CROP INCREASED

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 6, Jun 80 pp 64-66

[Article by L. Mozhayev, Kazakh Ministry of Agriculture deputy chief of the Main Farming Administration: "Kazakhstan Buckwheat Fields." Similar material was published in 76324/1251, dated 28 Aug 80, pp 88-89.]

[Text] Buckwheat is a valuable groats crop. It appeared comparatively recently in Kazakhstan, but has rapidly won a place for itself. Thus, whereas republic buckwheat fields comprised less than 5,000 ha in 1956-1960, they had increased to 71,000 ha in 1961-1965, and buckwheat plantings are now spread out over approximately 230,000 ha. Gross grain harvests and sales to the state have increased significantly.

The basic data on buckwheat production and sales, by republic oblast, are described by the following indicators (in 1,000 ha, q/ha, 1,000 tons):

Oblast	1971-1975				1976-1978			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
V-Kazakhstanskaya	2.5	5.6	1.4	0.9	8.3	8.3	6.8	3.7
Kokchetavskaya	8.1	4.0	3.2	1.1	0.6	0.6	0.4	0.3
Kustanayskaya	16.8	3.9	6.6	2.4	82.0	4.5	9.9	3.4
Pavlodarskaya	190.0	4.0	76.2	39.2	182.3	3.6	65.1	26.6
S-Kazakhstanskaya	7.7	4.3	3.3	1.0	9.5	9.9	9.4	4.9
Semipalatinskaya	3.0	3.7	1.1	0.6	2.7	7.0	1.9	0.7
Tselinogradskaya	1.0	5.0	0.5	0.6	0.2	5.0	0.1	0.1
Other oblasts	0.2	10.0	0.2	--	1.2	1.7	0.2	--
Total	229.3	4.0	92.5	45.5	226.8	4.1	93.8	39.7

Key:

1. Area
2. Yield
3. Gross harvest
4. Sales to the state

Pavlodarskaya Oblast is the primary buckwheat production region, accounting in recent years for upwards of four-fifths of all the area sown, 69-8[illegible] percent of the gross grain harvest, and 67-86 percent of sales to the state.

This valuable crop is also sown in Vostochno-Kazakhstanskaya, Kustanayskaya, Severo-Kazakhstanskaya and several other oblasts.

The republic has quite a few farms which are obtaining quite good [illegible] harvests because good farming techniques are used. Thus, during the 1975-1978 period, 52 sovkhozes and kolkhozes harvested an average of more than 10 q/ha on an area of upwards of 11,000 ha.

In 1978, "Medvezhinskiy" Sovkhoz in Severo-Kazakhstanskaya Oblast harvested 16.7 q/ha from 400 ha and "Mar'yevskiy" Sovkhoz harvested an average of 16.8 q/ha from 300 ha. At that time, that was the maximum. But this past year, "Frunzenskiy" Sovkhoz in Glubokovskiy Rayon, Vostochno-Kazakhstanskaya Oblast, harvested 22.8 q/ha from 108 ha, and the Kazakh Experimental Oil Crop Station harvested 20.6 q/ha from 230 ha. Last summer, the kolkhozes imeni Zhdanov and imeni Sverdlov and "[illegible]" and "Shemonaikhinskiy" sovkhozes in this same oblast harvested averages of 13 to 16 or more quintals per hectare.

The frontiers reached by the leading farms are quite high, if you bear in mind that buckwheat differs greatly from grain crops in terms of its biological features. First, it is heat-loving -- seed suddenly sprouts when the temperature gets above 12°C. In the sprout phase, buckwheat is very sensitive to frost, with considerable damage caused by temperatures of -2° and total loss at -4°. Second, it has a short growing period, only 70-80 days. Third, it is very demanding as to moisture, consuming twice as much water as spring wheat and three times as much as millet. The high moisture demand is especially evident during the blossoming period. Buckwheat farming techniques must therefore be aimed at maximum water availability during the most important period of plant development.

Buckwheat is also demanding as to predecessors. The best are bare fallow, perennial grasses, a vetch-oats mixture and row crops.

This crop manages well in potato crop rotations (potatoes are first planted in bare, well-fertilized fallow and buckwheat is sown afterwards). In this case, the field is usually clear of weeds, the soil is fairly loose, and the "old" organic and mineral fertilizers remaining after the potatoes help the plants develop.

That the agrotechnical cycle of bare fallow - potatoes - buckwheat is correct is confirmed by the high yields obtained on "Vozvyshenskiy," "Roshchinskiy" and "Pokrovskiy" sovkhozes in Severo-Kazakhstanskaya Oblast: 15-20 quintals per hectare.

But it is not just predecessors that are important to this crop. Also important is the choice of sectors for sowing it. It grows best among birch groves, protected by forest strips, near large bodies of water which soften the effect of the dry winds.

Buckwheat must be fertilized. Given yields of 20 quintals of grain and 60 quintals of straw, it "takes" 90 kg of nitrogen, 60 kg of phosphorous and 150 kg of potassium from the soil. It especially "likes" phosphorous.

According to data from the Karabalykskaya Agricultural Experimental Station, the application of three quintals of superphosphate per hectare increases grain yields by 2.3 q/ha. But on "Bobrovka" Sovkhoz in Pavlodarskaya Oblast, the application of superphosphate doubled buckwheat yields. In this regard, its grain was larger and heavier.

Buckwheat is a cross-pollinating crop, so bees have long been its best friend. Each farm with buckwheat plants should keep at least two swarms of bees per hectare in hives. The bees are actually faithful friends of buckwheat. For example, these volunteer assistants provided an important addition of up to two quintals per hectare on the kolkhoz imeni 30th anniversary of the Kazakh SSR and "Zhelezinskiy" Sovkhoz in Pavlodarskaya Oblast. On "Severnyy" Sovkhoz, the addition was even greater, up to 7.7 q/ha.

In view of the fact that buckwheat ripening, like its flowering, occurs nonsimultaneously, over about a month, people come out to harvest it when the fruit has turned brown on about 70 percent of the plants. The plants are swath-harvested. The threshing drum is rotated at 500-600 rpm to avoid crushing the grain.

Buckwheat is a very profitable crop. Its purchase price is three to four times higher than the price of spring wheat.

Still, Kazakhstan buckwheat fields could and must be larger, richer and more promising. This was the point of the party and government decrees and steps aimed at further developing this branch of agriculture.

We must first of all increase the yields from this valuable groats crop. Underharvesting is still high. Last year, republic sovkhozes and kolkhozes obtained an average of only four quintals of buckwheat grain per hectare. Of course, interference from the weather must be taken into account -- dry periods when the plants were flowering and the grain was taking form. It was due largely to this that the main producers of marketable grain from this crop, Pavlodarskaya and Kustanayskaya oblasts, harvested less than the republic average.

It is has long been a proven fact that proper farming techniques successfully combat interference by the elements. If the entire agro-biological complex taking into account the features of this particular crop is carried out on time and properly, the yield-increase factor operates unfailingly.

A second "brake" on expanding buckwheat plantings is the lack of varieties best adapted to local conditions. We are currently cultivating throughout the republic the "Bogatyr'" [Hercules] variety, quite an old one, which was at one time developed at the Orlovskaya Oblast State Agricultural Experimental Station. Intended for cultivation on the fields of the central zone of Russia, "Bogatyr'" is not drought resistant, and that is its primary "Achilles heel." Our farmers do not have at their disposal local selection intensive varieties more suitable to Kazakhstan conditions. The agricultural scientific institutions should long ago have concentrated efforts on developing new and highly productive varieties of buckwheat.

And neither has the problem of interesting farms in growing this capricious crop been fully solved. Of course, the high purchase price more or less ensures production profitability, but those sovkhozes and kolkhozes which are not especially concerned about increasing yields willingly condemn themselves to a lower overall grain production. And since their production activity is evaluated not only by financial results, but also by level of fulfillment of overall assignments set for sales of grain to the state, it is quite natural that farm leaders and specialists prefer the higher-yield varieties of wheat or barley. For example, sovkhozes and kolkhozes of Pavlodarskaya Oblast harvested an average of 12.1 q/ha of grain crops this past year, which buckwheat yielded 3.4 q/ha, or nearly 3.6 fold less.

It is paradoxical when a consequence -- low yields -- generates a cause, that is, the reduction in area sown to buckwheat. Last year alone, farms of Pavlodarskaya Oblast decreased the area sown to this crop by 99,000 ha.

What is the answer? It is apparently to develop and put into effect a qualitatively new system of reckoning state plan fulfillment. This system must put low-yield buckwheat on the exact same level with other, higher yield crops. In any case, this system will be needed until the yields from this valuable groats crop are higher everywhere. That is not an easy or a short-term matter.

We require a more attentive attitude towards the distribution of buckwheat on Kazakhstan fields. For example, Pavlodarskaya Oblast simply is overloaded with buckwheat plantings, and many farms are producing it although the natural conditions here do not always correspond to the biological requirements of this crop. At the same time, Kokchetavskaya, Tselinogradskaya, Vostochno-Kazakhstanskaya and Semipalatinskaya oblasts, where a number of regions have more favorable opportunities, are free of any plans to sell buckwheat grain.

And almost no consideration is given to the reserve of developing late-summer buckwheat on irrigated fields in the republic's southern oblasts. The Kazakh Scientific Research Institute of Farming has made certain inquiries into this area, with promising results, but farms have not received specific recommendations, and late-summer buckwheat sowings essentially remain only in the scientific literature.

...Everybody loves buckwheat kasha, but it doesn't just appear on the table unless we are concerned about the buckwheat fields, and that must be a concern shared by everyone, the sovkhozes and kolkhozes and the scientific and procurement organizations of the republic.

11054
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TILLING AND CROPPING TECHNOLOGY

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GRAIN CROP DEVELOPMENT POTENTIAL IN OMSK, NOVOSIBIRSK, ALTAYSKIY KRAY

Moscow ZERNOVOYE KHOZYAYSTVO in Russian No 7, Jul 80 pp 2-3

[Article by V. R. Boyev, director of the Siberian Scientific Research Institute of Economics of Agriculture, corresponding member of the VASKhNIL [All-Union Order of Lenin Academy of Agricultural Sciences imeni V. I. Lenin]: "The Potential of the Siberian Field"]

[Text] Western Siberia possesses enormous potential capabilities to increase the output of agricultural products. Forthcoming goals have been determined considering the requirement to obtain from each hectare of arable land 18-20 quintals of feed units, including at least 10 quintals of grain given an average yield of 17-20 quintals per hectare. But, the productivity of 1 hectare of arable land during the 10th Five-Year Plan still remains low. Moreover, this is exacerbated by major fluctuations in grain yields over the years due to weather conditions. For example, deviations from the average yield in Altayskiy Kray on the average for 1971-1979 rose 15 percent in comparison with the preceding five-year plan. Primarily this is explained by the fact that grain yield is increasing in years with a favorable combination of weather conditions as a result of an increasing farming culture. But, grain productivity remains low in years of bad drought. Proper evaluation of natural and economic conditions, selection of ways to ameliorate the negative impact of climatic factors, and their practical implementation make it possible to increase farming stability.

Farming stability means not preservation of the achieved level of production and of other qualitative indicators, but rather insuring a consistent increase in product output computed per hectare of arable land and unit of labor expenditure and production resources, given minimal fluctuations in these indicators by years from that achieved on the foundation of level intensification.

Climate, land quality, location, and production resources are of special significance among the factors affecting stable development of agricultural production. This in a way is the linchpin of effective grain management.

Placement of each specific crop in areas and on farms possessing soil and climatic conditions most favorable for their growth might be the simplest and most radical solution of the problem of improving farming stability. But, this approach is unrealistic due to the necessity to produce a large amount of wheat, rye, groat, and pulse seed crops. Therefore, the problem is to reduce to the minimum the negative impact of soil and climatic factors on quantitative and qualitative indicators through rational specialization and intensification of production everywhere. This problem can be solved, given broad introduction of the achievements and leading know-how and rational use of production resources. The results of operating experimental farms and many progressive kolkhozes and sovkhozes, which in yield from the fields and animal husbandry productivity even during unfavorable years outstrip their neighbors by a factor of 1.5-2.5, prove that this problem can be solved.

Know-how in organizing grain production at western Siberia's progressive farms demonstrates the high degree to which they put local agroclimatic and economic resources to use. For example, OPKh [Experimental Model Farm] imeni V. V. Kokuchayev (Omskaya Oblast) as early as 1960 began to introduce a soil conservation agrocomplex, which includes rational organization of territory, soil conserving crop rotation with clean and occupied fallow, planar cut treatment, mulching the fields with straw, disking of perennial grasses and underwinter fallow, and application of nitrogen-phosphorous fertilizers. At the present time, only soil conservation treatment is carried out on all arable land (8,250 hectares; during the 8th Five-Year Plan this was done on 3,230 hectares). Annually, in excess of 4,000 hectares of fields are mulched with chopped straw and the share of clean (predominently coulisse) fallows increased from 1.5 to 12 percent. Application of mineral fertilizers rose from 12.3 to 45-50 kilograms per hectare d.v. [active matter]. Here is the result. If during the 7th Five-Year Plan grain yield was 12.1 quintals per hectare and grain yield per hectare of arable land was 8.7 quintals, then the corresponding figures for the 8th Five-Year Plan were 13.2 and 8.6; for the 9th Five-Year Plan they were 21 and 12.1 quintals per hectare. During the past 4 years, the grain yield per hectare was at the 20-22 quintals level. The coefficient of use of annual rainfall by grains rose during this time by a factor of 2.4.

Rayon and farm actual agroclimatic resources can be most efficiently employed through zonal and microzonal agrocomplexes, which will make it possible to raise the productiveness of the Siberian field by a factor of 2-2.5. This can be seen using Muromtsevskiy Rayon, Omskaya Oblast as an example. Kolkhozes and sovkhozes there, prior to introduction of crop rotations with clean fallow (1959-1970), averaged 5.4 quintals of grain per hectare, given an average annual yield of 8.3 quintals per hectare. After introduction of crop rotations with clean fallow (1976-1979), the yield in the rayon rose to 16.3 quintals per hectare and grain yield per hectare reached 8.4 quintals, or a 55 percent increase. During the past 2 years here, they have been producing about 1 ton of grain per hectare. In the region now, 20 percent of the arable land lies in clean fallow and 51 percent is planted to grains. Only 10 kilograms d.v. of mineral fertilizers are applied per hectare of arable land.

This equals that expended on a majority of the farms in Omskaya and Novosibirskaya oblasts and Altayskiy Kray. But, crop rotations with clean fallow make it possible to modify and rationally to use soil resources to form a large harvest and to compensate for shortages of mineral fertilizers.

Based on agrotechnical research data, more than 50 percent of Siberia's arable land has an average, low, or very low supply of phosphorous accessible for assimilation by plants. If the plant food in a fallow field is balanced by application of phosphorous fertilizers and it is planted to unlodged varieties of an intensive type spring wheat (Omsk 9, Novosibirsk 67, Vera for instance), the harvest from the clean fallow will rise to 30 quintals and more per hectare. However, in the computation per hectare in the zone, only 1.3 tons of organic fertilizer and 22-25 kilograms d.v. of mineral fertilizer are required. Planning organs should more fully satisfy Siberian farmers' fertilizer requirements. Moreover, every kilogram of active matter of the latter provides 5 kilograms of wheat, 7-8 of oats and barley, and 50 kilograms of corn green mass.

Western Siberia has significant capabilities to produce high-quality grain. Know-how from kolkhozes and sovkhozes in southern Omskaya Oblast, which in 1978-1979 sold more than 700,000 tons of strong grain, affirms this. In the past year, every other ton of the 2 million tons of grain sold in the oblast was of valuable varieties. It is advisible to concentrate production of such grain in the Aleysk, Kulunda, and Ob' zones of Altayskiy Kray, the Kulunda and southern portion of the Barabino zones of Novosibirskaya Oblast, and the steppe and a portion of the forested steppe zones of Omskaya Oblast. Besides the steppe areas of Omskaya Oblast, cultivation of hard wheat can be concentrated in a portion of the areas in the Biysk-Chumysh and Aleysk zones in Altayskiy Kray.

There are serious shortcomings in contemporary dispositions by zones and in the structure of grain sowings. Thus, the share of winter rye in the foothills zone doesn't exceed 1 percent, while the yield of this crop here is higher than that of spring wheat by 3.5-4 quintals per hectare. The situation is analogous in the taiga and sub-taiga zones--9 percent, in the northern forested steppe zone--4 percent. To increase the grain yield in the foothills portion of Altayskiy Kray, it is advisible to expand the planting of winter wheat, whose area here at present barely reaches 7,000 hectares. The planting of polygonum and millet is disposed without considering the soil and climatic conditions on all farms on small plots, which impedes the growth in their yield and mechanization of cultivation and harvest (on the average 125 hectares of polygonum and 13 of millet per farm in the zone).

Changes in the structure and disposition of grains should closely be linked to the organization of feed production on plowed and on natural feed lands. There is a requirement to change the structure and disposition of individual animal husbandry sectors to take complete advantage of optimizing the way arable land is used and grains are planted in a number of areas and on farms.

Timely and high-quality execution of elementary technological operations when preparing soil, planting and caring for the crop, and harvesting it, taking specific weather conditions into account, acquires special significance for raising the efficiency of a grain farm. One can introduce proper crop rotation and have first-class seed, fertilizer, and equipment, but one cannot have a good harvest if the planting is not done at the required depth or the sowing rate deviates from the optimal. Losses due to similar violations especially are telling in those cases when one deviation from the demands of a [illegible] technology is exacerbated by another. For example, incorrect placement of the seed in the soil is combined with late planting, underrating the battle against weeds or incorrect selection of how to organize the harvest and when to do it. This must be underscored because the width of the cut, the speed of the operation, and the power of the equipment that carries out the vital cultivation and harvest of grain and other crops increase every year. It is one thing to suffer losses due to improper seed placement by a single drill and something else again when it is a K-701 tractor pulling three or five drills. All this elevates the required level of qualification of machine operators and other workers participating in production, the technical state of resources used, the organization of services that monitor work quality and adherence to technological discipline. One of the vital reserves for improving agricultural stability and efficiency is found here. And, it must be put to full use.

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EFFECT OF UNEVEN SOWING BY SEED DRILLS

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[Article by Candidate of Technical Sciences M. K. Kuznetsova, Engineer M. A. Vinogradov (KazNIIMESKh) [Kazakh Scientific Research Institute of Mechanization and Electrification of Agriculture], Candidate of Agricultural Sciences V. V. Zhigaylov, and Engineer A. N. Varava (Kazakh Scientific Research Institute of Farming): "Uneven Sowing by Seed Drills"]

[Text] Uneven sowing is one of the chief indicators of the quality of seed drill operation. In accordance with extant agricultural requirements, uneven sowing between seed drill colters should not exceed ±3 percent and that of stubble drills ±5 percent. There are no data in the literature, which substantiate these tolerances. It is logical to assume that the more even the sowing, i.e., the more accurate the seed distribution by drill rows, the greater the yield of the sown crop. At the same time, this indicator is restricted by the technical capabilities of seeders at a given stage in the development of their designs.

The problem of a substantiated tolerance for uneven sowing of grain crops at present acquires special significance due to development of new, wide-cut seed drills, which in future years should replace the seeders presently in use. Creation of wide-cut drills was envisioned by the Machinery System for 1976-1980, which was stipulated by the necessity to increase the productivity of seeders, their standardization, their unitizing with tractors of various tractive classes, the reduction of monotypic aggregates and of regulation to a minimum, and so on. All this should reduce the production cost of sowing operations and reduce the number of workers occupied in sowing.

The increase in the width of the drill cut made it possible to use in them a centralized sowing system (TsVS), which envisions a common hopper, batcher, and spreaders and use of a stream of air to transport the seed to the colters. However, foreign seeders with an TsVS, as far as uneven sowing between colters is concerned, do not meet our agrotechnical requirements.

In this connection, several questions arise: to what degree do domestic seed drills under production conditions meet agrotechnical requirements; how does uneven sowing impact upon the reduction in grain crop yield; how much unevenness is permissible?

It is known that seed crop yield is affected by [illegible] [illegible]tion of the plants, which in turn depends upon many factors, to wit: [illegible] distribution of the seeds in the drill rows, compactness of the sowing to the assigned depth, soil condition, weather, quality of the seeds, and so on.

There is little in the literature about the influence of the various factors on the uneven distribution of plants. Of the known sources, D. B. Dunayevskiy's work on determining the relationship of uneven plant distribution to seed quality is of interest.* The author established that given the ideal distribution of seeds with a field germination rate of 90 percent, the plant distribution unevenness factor exceeds 30 percent, exceeds 40 percent with a field germination rate of 80 percent, and 60 percent with a rate of 50 percent. This also is confirmed by research linked to creation of accurate drills conducted by scientists from VISKhOM [All-Union Order of Labor's Red Banner Scientific Research Institute of Agricultural Machine Building imeni V. P. Goryachkin]. Field tests established that the uneven distribution of seedlings in a field sown by a seed spacing drill is higher than the uneven sowing by this drill. The field germination rate of the seeds impacted upon seedling distribution, as a result of which the condition of the field sown by a seed spacing drill practically speaking was identical to the fields sown by production drills. Consequently, uneven sowing only is one of many factors impacting upon the reduction in the yield of the planted crop and its impact is less, for instance, than that of the seed field germination rate.

A survey of drills on the grain sovkhozes in Alma-Atinskaya Oblast was conducted by the KazNIIMESKh jointly with the Kazakh Scientific Research Institute of Farming to get a clear picture of uneven sowing of grain crops under production conditions. Also, experiments were run to determine the effect of speed of equipment movement and the sowing rate on uneven sowing under field conditions. In addition, the Kazakh Scientific Research Institute of Farming ran agrotechnical experiments to determine the permissible amount of uneven sowing under conditions found in southern Kazakhstan.

SZ-3.6 drills, which had operated one to two seasons, were surveyed. Brigade workers (just as is done on the farm) prepared the drills for the operation and adjusted them to the established rate. Test runs 50 meters long were made in a field prepared for winter wheat. The equipment moved at about 7 kilometers per hour and the tests were repeated three times.

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*Dunayevskiy, D. V. "Nekotoryye voprosy formirovaniya posevnogo ryadka i otsenki kachestva raboty posevnykh mashin." ["Some Problems in Formation of the Planted Drill Row and Evaluation of the Quality of Seeder Operations"]. VASKhNIL [All-Union Academy of Agricultural Sciences imeni V. I. Lenin] Works. "Norma vyseva, sposoby poseva i ploshchadi pitaniya sel'skokhozyaystvennykh kul'tur." ["Sowing Norm, Sowing Methods, and Feeding Area of Agricultural Crops"]. Moscow, Kolos, 1971.

Table 1 shows the results obtained. It was established that an increase in speed from 5.3 to 11.2 kilometers perhour materially does not influence the uneven sowing between drill colters. Increased uneven sowing is observed at lower sowing rates (Table 2).

Table 1

Sovkhoz	Test Number	Average Sowing By One Colter In A Record Run, grams	Variation Factor V, % (OST 70.5.1-74)	Average Uneven Sowing, % (GOST 3018-52)
Kaskelenskiy	1	161	8.74	6.67
	2	178	12.35	11.54
	3	147	9.78	8.10
	4	186	13.50	11.77
	5	182	6.88	4.91
	6	205	6.10	4.80
	7	135	7.47	5.96
	8	137	13.74	9.83
	9	140	12.11	8.40
Iliyskiy	1	114	13.78	10.70
	2	110	14.92	11.53
	3	93	12.09	8.42

Table 2

Sowing Rate, Million Grains per hectare	Drill Speed, km/hr	Variation Factor V, % (OST 70.5.1-74)	Average Uneven Sowing, % (GOST 3018-52)
1	5.3	13.90	11.18
	7.3	12.20	9.88
	11.2	12.65	9.88
2	5.3	11.31	9.38
	7.3	12.67	9.88
	11.2	11.93	9.82
3	5.3	8.86	7.27
	7.3	8.35	6.66
	11.2	8.20	6.60

Agrotechnical experiments were conducted in light sandy loam sierozems wi two crops--"Bezostaya-1" winter wheat and "Nutans-970" spring barley. T sowing was done with SZS-2.1 and SZ-3.6 drills with optimum sowing rates for these drills in this zone. On the specially-equipped drills, they used individual adjustment of the feeds by changing the length of each drum's working element separately. For example, each record feed was set for ±10 percent uneven sowing by increasing the sowing rate 10 percent. The control feeds were decreased 10 percent, i.e., the close drill rows were alternated with the dispersed drill rows.

It should be noted that the agrotechnical experiments were run in a zone where the field germination rate of the crops fluctuates between 70-80 percent (depending upon the year's climatic conditions). In order to eliminate the impact of the field germination rate on the unevenness of plant distribution, as discussed previously, the sowing rate was increased 30 percent, with subsequent checking and adjustment of the seedlings in the drill rows. Thus, a 100 percent seed field germination rate was created artificially.

The years the experiments were run (1976-1977) were dry--a total of approximately 80 millimeters of rain fell during the spring and summer, or 60-70 percent of their average yearly rate and this negatively impacted on the grain crop yield.

A sampling of bundles to determine yield separately in the crowded and dispersed drill rows showed that drill row compactness influenced the reduction in yield, given a row width of 15 centimeters (the SZ-3.6 drill) and a sowing rate of 3 million grains per hectare. Productive tillering in the crowded drill rows totalled 0.9-1. In addition, the number of grains in the spike the grain's absolute mass, and plant preservation in comparison to the control (unevenness ±3 percent) decreased in these drill rows. Productive tillering, the number of grains in the spike, and the grain's absolute mass in the dispersed drill rows increased slightly, but the number of plants decreased 14-22 percent; the yield in this variation almost equaled that of the control.

Because the dispersed drill rows were not compensated for by a loss of yield in the crowded drill rows, the barley yield dropped (Table 3). Thus, the barley yield in the control sector in 1976 was 6.2 quintals per hectare and was 5.8 quintals per hectare, given ±22 percent uneven sowing.

Table 3

Model Drill	Sowing Rate, Million Grains per Hectare	Uneven Sowing, %	Barley Yield, quintals/hectare		
			Crowded Drill Row	Dispersed Drill Row	Average By Variant
SZ-3.6	3	3	6.2/5.1	6.2/5.1	6.2/5.1
		6	6.4/5.0	6.2/5.1	6.3/5.1
		10	6.1/5.0	6.3/5.0	6.2/5.0
		14	5.6/4.8	6.2/5.1	5.9/4.9
		18	5.5/4.7	6.3/5.1	5.8/4.9
		22	5.4/4.2	6.4/5.1	5.8/4.6
SZS-2.1	2	3	6.6/3.9	6.5/3.9	6.6/3.9
		6	6.6/3.9	6.2/3.8	6.4/3.9
		10	6.7/3.7	6.6/3.9	6.7/3.8
		14	6.3/3.6	6.1/3.7	6.2/3.7
		18	6.0/3.5	5.9/3.6	5.9/3.6
		22	5.9/3.1	5.7/3.4	5.8/3.3

NOTE: 1976 data in numerator, 1977 data in denominator

The barley yield also dropped with an increase in uneven sowing, given a row width of 23 centimeters (SZS-2.1 drill) and a sowing rate of 2 million grains per hectare. Both the dispersal and the closeness of the seedlings in this case impacted upon the reduction in yield. In both variants of the experiment, the number of plants decreased, but the productive tillering did not rise.

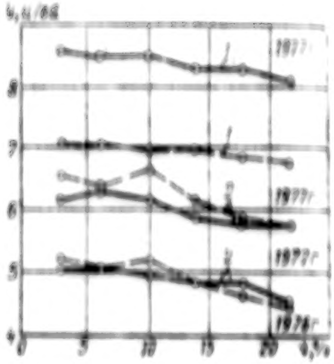
Similar results were obtained in experiments with winter wheat. The closeness of the plants in the drill rows had a greater impact here, quite evident from the lower yield of wheat in the plots sown by the SQS-2.1 drill as compared to the SZ-3.6, given the identical sowing rate.

Analysis of data obtained in 1977 (Table 4) shows that a 22 percent drill row closeness reduces winter wheat yield 1.8 quintals per hectare and a 22 percent drill row dispersal increases yield overall 0.8 quintals per hectare in comparison to the control, i.e., ±22 percent uneven sowing between colters reduces yield 0.5 quintals per hectare.

Table 4

Model Drill	Sowing Rate, Million Grains per Hectare	Uneven Sowing, %	Winter Wheat Yield, quintals/hectare		
			Crowded Drill Row	Dispersed Drill Row	Average By Variant
SZ-3.6	4	3	8.5	8.7	8.6
		6	8.3	8.7	8.5
		10	8.1	8.9	8.5
		14	7.6	9.0	8.3
		18	7.2	9.1	8.3
		22	6.7	9.5	8.1
SZS-2.1	4	3	7.0	7.1	7.1
		6	7.0	7.1	7.1
		10	6.7	7.3	7.0
		14	6.6	7.4	7.0
		18	6.4	7.4	6.9
		22	6.0	7.7	6.8

The relationship of grain crop yield and uneven sowing between SZ-3.6 and SZS-2.1 drill colters is represented in the graph. A reduction in yield is noted when uneven sowing between drill colters is increased from 3 to 22 percent. A stable drop in yield is noted, given uneven sowing in excess of 10 percent.



Relationship of Yield Y of Wheat (1) and Barley (2)
On Uneven Sowing V Between Drill Colters:
solid line SZ-3.6; dotted line SZS-3.6

Thus, the resultant experiments established that uneven sowing permitted by agricultural requirements turns out to be unfulfilled under production conditions. In addition, the indicator of uneven sowing between grain drill feeds changes depending upon the sowing rate. Due to a tendency to reduce the grain crop sowing rate, it should be borne in mind that uneven sowing between drill colters in this case significantly is higher than permissible.

Data from agrotechnical experiments show that, under the conditions in southern Kazakhstan, an increase in uneven sowing between feeds of up to ±10 percent doesn't impact upon grain crop yield. Consequently, for the zone in question, the tolerance can be increased by a factor of 2-3 in comparison with the confirmed tolerance.

The preliminary conclusion examined concerning permissible uneven sowing between seed drill feeds requires checking and refinement. There is a requirement to set up and accomplish similar work in other soil and climatic zones in the country since the limit of uneven sowing determines the selection of trends in creation of new drills and the time frames and resources for their development. Designers and researchers developing new seeding machines must have a substantiated tolerance for uneven sowing of field crops.

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